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BEFORE THE ARIZONA CORPORATION COMMISSIONCOMMISSIONERS

Arizona Corporation Commission

DOCKETED

TOM FORESE – Chairman
BOB BURNS
DOUG LITTLE
ANDY TOBIN
BOYD W. DUNN

SEP 19 2017

DOCKETED BY

IN THE MATTER OF THE APPLICATION OF
ARIZONA PUBLIC SERVICE COMPANY FOR A
HEARING TO DETERMINE THE FAIR VALUE OF
THE UTILITY PROPERTY OF THE COMPANY
FOR RATEMAKING PURPOSES, TO FIX A JUST
AND REASONABLE RATE OF RETURN
THEREON, TO APPROVE RATE SCHEDULES
DESIGNED TO DEVELOP SUCH RETURN.

DOCKET NO. E-01345A-16-0036

IN THE MATTER OF FUEL AND PURCHASED
POWER PROCUREMENT AUDITS FOR ARIZONA
PUBLIC SERVICE COMPANY.

DOCKET NO. E-01345A-16-0123

DECISION NO. 76374**OPINION AND ORDER**

DATE OF HEARING:

October 20, 2016 and January 11, 2017 (Procedural
Conferences); April 20, 2017 (Pre-Hearing Conference);
April 24, 25, 26, 27, 28, May 1 and 2.

PLACE OF HEARING:

Phoenix, Arizona

PUBLIC COMMENT HEARINGS:

March 15, 2017 (Douglas, Arizona); March 22, 2017
(Phoenix, Arizona); March 29, 2017 (Clarkdale,
Arizona); April 3, 2017 (Flagstaff, Arizona); April 20,
2017 (Yuma, Arizona)

ADMINISTRATIVE LAW JUDGE:

Teena Jibilian

APPEARANCES:

Mr. Thomas Loquvam, Mr. Thomas Mumaw, Ms.
Melissa Krueger, and Ms. Amanda Ho, PINNACLE
WEST CAPITAL CORPORATION, and Mr. Ray
Heyman, SNELL & WILMER, LLP on behalf of Arizona
Public Service Company;

Ms. Meghan H. Grabel, OSBORN MALEDON, on
behalf of Arizona Investment Council;

Mr. Nicholas J. Enoch, LUBIN & ENOCH, PC, on behalf
of Local Unions 387 and 769 of IBEW, AFL-CIO;

Mr. Timothy J. Sabo, SNELL & WILMER, LLP, on
behalf of REP America d/b/a ConservAmerica;

1 Mr. Garry D. Hays, LAW OFFICES OF GARRY D.
2 HAYS, PC, on behalf of Arizona Solar Deployment
3 Alliance;

4 Mr. Timothy Hogan, ARIZONA CENTER FOR LAW
5 IN THE PUBLIC INTEREST, on behalf of Arizona
6 School Boards Association, Arizona Association of
7 School Business Officials, Arizona Community Action
8 Association, Arizona Community Action Association,
9 Western Resource Advocates, Southwest Energy
10 Efficiency Project and Vote Solar;

11 Mr. David Bender and Ms. Chinyere Osuala,
12 EARTHJUSTICE, on behalf of Vote Solar;

13 Mr. Giancarlo G. Estrada, KAMPER ESTRADA, LLP,
14 on behalf of Solar Energy Industries Association;

15 Mr. Court S. Rich, ROSE LAW GROUP, PC, on behalf
16 of Energy Freedom Coalition of America;

17 Mr. Craig A. Marks, CRAIG A. MARKS, PLLC, on
18 behalf of Arizona Utility Ratepayer Alliance;

19 Mr. Kurt J. Boehm, BOEHM KURTZ & LOWRY, on
20 behalf of The Kroger Co.;

21 Mr. Scott S. Wakefield, HEINTON & CURRY, PLLC,
22 on behalf of Wal-Mart Stores, Inc. and Sam's West, Inc.;

23 Ms. Brittany L. DeLorenzo, on behalf of IO DATA
24 CENTERS, LLC;

25 Mr. Patrick J. Black, FENNEMORE CRAIG, PC, on
26 behalf of Freeport Minerals Corporation and Arizonans
27 for Electric Choice and Competition;

28 Mr. Lawrence V. Robertson, Jr., on behalf of Calpine
Energy Solutions, LLC, Constellation New Energy, Inc.,
and Direct Energy Business, LLC;

Mr. Greg Patterson, MUNGER CHADWICK, on behalf
of Arizona Competitive Power Alliance;

Mr. Jay I. Moyes and Mr. Jason Moyes, MOYES
SELLERS & HENDRICKS, LTD, on behalf of Electrical
District Number Eight and McMullen Valley Water
Conservation & Drainage District;

Mr. Albert H. Acken, RYLEY CARLOCK &
APPLEWHITE, on behalf of Electrical District Number
Six, Pinal County, Arizona, Electrical District Number
Seven of the County of Maricopa, State of Arizona,
Aguila Irrigation District, Tonopah Irrigation District,
Harquahala Valley Power District, and Maricopa County
Municipal Water Conservation District Number One;

Capt. Lanny L. Zieman and Capt. Natalie A. Cepak, on behalf of Federal Executive Agencies;

Mr. John B. Coffman, JOHN B. COFFMAN, LLC, and Ms. Ann-Marie Anderson, WRIGHT WELKER & PAUOLE, PLC, on behalf of AARP;

Mr. Greg Eisert, on behalf of Sun City Homeowners Association;

Mr. Al Gervenack, on behalf of Property Owners & Residents Association;

Mr. Richard Gayer, pro se;

Mr. Warren Woodward, pro se;

Mr. Daniel W. Pozefsky, on behalf of the Residential Utility Consumer Office; and

Ms. Maureen A. Scott, Deputy Chief of Litigation/Appeals, Mr. Wesley C. Van Cleve, and Mr. Charles H. Hains, Staff Attorneys, Legal Division, on behalf of the Utilities Division of the Arizona Corporation Commission.

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BY THE COMMISSION:**I. PROCEDURAL HISTORY**

On June 1, 2016, Arizona Public Service Company ("APS" or "Company") filed with the Arizona Corporation Commission ("Commission") the above-captioned Rate Case Application ("Application"), which is based on a test year ending December 31, 2015.

On July 22, 2016, a Rate Case Procedural Order was issued setting the procedural schedule and associated procedural deadlines for the Application, and indicating that pursuant to Commission Decision No. 75047 (April 30, 2015) in Docket No. E-01345A-13-0069, issues related to APS's proposed Automated Meter Opt-Out Service Schedule in that docket would also be addressed in this proceeding.

On August 1, 2016, a Procedural Order was issued granting a Motion by the Commission's Utilities Division ("Staff") to consolidate Docket No. E-01345A-16-0123 with the Application.

Parties to this docket are APS, the Commission's Utilities Division ("Staff"), Richard Gayer; Patricia Ferré; Warren Woodward; IO Data Centers, LLC ("IO"); Freeport Minerals Corporation ("Freeport"); Arizonans for Electric Choice and Competition ("AECC"); Sun City Home Owners Association ("SCHOA"); Western Resource Advocates ("WRA"); Arizona Investment Council ("AIC"); Arizona Utility Ratepayer Alliance ("AURA"); Property Owners and Residents Association of Sun City West ("PORA"); Arizona Solar Energy Industries Association ("AriSEIA"); Arizona School Boards Association ("ASBA"); Arizona Association of School Business Officials ("AASBO"); Cynthia Zwick (in her personal capacity); Arizona Community Action Association ("ACAA"); Southwest Energy Efficiency Project ("SWEEP"); the Residential Utility Consumer Office ("RUCO"); Vote Solar; Electrical District Number Eight and McMullen Valley Water Conservation & Drainage District (collectively, "ED8/McMullen"); The Kroger Co. ("Kroger"); Tucson Electric Power Company ("TEP"); Pima County; Solar Energy Industries Association ("SEIA"); the Energy Freedom Coalition of America ("EFCA"); Wal-Mart Stores, Inc. and Sam's West, Inc. (collectively, "Walmart"); Local Unions 387 and 769 of the International Brotherhood of Electrical Workers, AFL-CIO (collectively, "the IBEW Locals"); Calpine Energy Solutions LLC ("Calpine")(formerly Noble

1 Energy Solutions, LLC); the Arizona Competitive Power Alliance (“the Alliance”); Electrical District
2 Number Six, Pinal County, Arizona (“ED 6”), Electrical District Number Seven of the County of
3 Maricopa, State of Arizona (“ED7”), Aguila Irrigation District (“AID”), Tonopah Irrigation District
4 (“TID”), Harquahala Valley Power District (“HVPD”), and Maricopa County Municipal Water
5 Conservation District Number One (“MWD”) (collectively, “Districts”); the Federal Executive
6 Agencies (“FEA”); Constellation New Energy, Inc. (“CNE”); Direct Energy Business, LLC (“Direct
7 Energy”); AARP; the City of Sedona (“Sedona”); Arizona Solar Deployment Alliance (“ASDA”); the
8 City of Coolidge (“Coolidge”); REP America d/b/a ConservAmerica (“ConservAmerica”); and Granite
9 Creek Power & Gas and Granite Creek Farms LLC (collectively, “Granite Creek”).

10 The full procedural history of this proceeding is set forth in the Findings of Fact herein.

11 On March 27, 2017, a Settlement Agreement was docketed, signed by APS, AIC, the IBEW
12 Locals, ConservAmerica, ASDA, Vote Solar, EFCA, SEIA, AriSEIA, AURA, Freeport, AECC, Direct
13 Energy, CNE, Calpine, the Alliance, Walmart, Kroger, Granite Creek, FEA, Coolidge, WRA, ASBA,
14 AASBO, SCHOA, PORA, ACAA, RUCO, and Staff (“Settling Parties”). The Settlement Agreement
15 resolved all disputed issues between the Settling Parties with the exception of two, one of which was
16 resolved prior to the hearing, and one of which was resolved prior to the Open Meeting during which
17 the Commission considered and voted on the Application.

18 On April 24, 2017 through May 2, 2017, a full evidentiary hearing was held on the Application
19 and Settlement Agreement. Of the parties who did not sign the Settlement Agreement, Mr. Gayer, Mr.
20 Woodward, SWEEP, ED8/McMullen, the Districts, and AARP participated in the hearing and in the
21 post-hearing briefing process.

22 On May 17, 2017, APS, AIC, the IBEW Locals, ConservAmerica, ASDA, Vote Solar, EFCA,
23 SEIA, AURA, Freeport, AECC, Calpine, CNE, Direct Energy, Walmart, FEA, ED8/McMullen, the
24 Districts, ACAA, SWEEP, AARP, Mr. Gayer, Mr. Woodward, RUCO, and Staff filed Initial Closing
25 Briefs.¹

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28 ¹ Freeport, AECC, Calpine, CNE, and Direct Energy jointly filed an Initial Closing Brief. Mr. Gayer filed his Initial Closing Brief on May 15, 2017.

On June 1, 2017, APS, AIC, the IBEW Locals, ConservAmerica, EFCA, Freeport, AECC, Calpine, CNE, Direct Energy, SWEEP, Mr. Woodward, and Staff filed Reply Closing Briefs.²

Numerous public comments were filed.

Following the parties' filings of Initial Closing Briefs and Reply Closing Briefs, this matter was taken under advisement by the Administrative Law Judge pending the submission of a Recommended Opinion and Order for the consideration of the Commission.

II. INTRODUCTION

Pursuant to Commission Decision No. 75047 (April 30, 2015) and the Rate Case Procedural Order in these dockets, issues related to APS's Proposed Automated Meter Opt-Out Service Schedule were addressed in this proceeding. In the Application, APS proposed an AMI Opt-Out option for residential customers, excluding those with distributed generation ("DG"), who wish to be served with a digital meter and manual meter reading instead of the AMI system, whereby AMI meters would be read automatically through APS's AMI communication network. In its Rate Application, APS proposed a one-time special installation charge of \$70 for digital non-AMI meters, and a monthly charge of \$15 for manual reading of non-AMI meters by APS personnel.³ The parties to the Settlement Agreement agreed with, and the Settlement Agreement adopted, APS's AMI Opt-Out program proposal, with a reduction in the fee amounts APS proposed in the Rate Application.

On August 18, 2017, the Commission issued Decision No. 76295 in these consolidated dockets, resolving all issues in this docket with the exception of non-AMI meter issues. Those issues, which were litigated in the evidentiary hearing, were bifurcated from Decision No. 76295, and this Decision solely addresses those issues.

In pertinent part, Section 30 of the Settlement Agreement⁴ provides:

30.1 The AMI Opt-Out program will be approved as proposed by APS except the fees will be changed to reflect an upfront fee of \$50 to change out a standard meter for a non-standard meter and monthly fee of \$5. See Service Schedule 1, attached as Appendix M.

² Freeport, AECC, Calpine, CNE, and Direct Energy jointly filed a Reply Closing Brief. On June 1, 2017, RUCO filed notice that it would not be filing a Reply Closing Brief.

³ Hearing Exhibit APS-4 (Direct Testimony of Charles Miessner) at 58.

⁴ Exhibit A to this Decision includes (1) a copy of the Settlement Agreement filed in these dockets on March 27, 2017; and (2) Appendix M to the Settlement Agreement.

30.2 Changes to Schedule 1 are attached in Appendix M.

Two parties who participated in this proceeding oppose the adoption of Section 30 of the Settlement Agreement, and request additional relief in relation to APS's metering program. This Decision resolves those disputed issues.

III. POSITIONS OF THE PARTIES

Mr. Gayer and Mr. Woodward disagreed with the Settlement Agreement's proposed resolution of non-AMI meter issues.⁵ The positions of the parties who briefed the non-AMI meter issues in this proceeding are set forth below.

a. Mr. Woodward

Mr. Woodward opposes adoption of Section 30 of the Settlement Agreement. He argues that to Opt-Out of APS's standard AMI metering, no customer should be required to pay any fees, which he terms "extortion," due to the issues he alleges are associated with use of AMI meters. Mr. Woodward contends that contrary to APS's assertion that his arguments fundamentally concern AMI itself, and not the AMI Opt-Out program, he presented "pages and pages of substantiated arguments as to why the fees proposed in the so-called 'program' are unwarranted."⁶ Mr. Woodward contends that "APS's 'smart' grid is grossly inefficient and unaffordable, a violation of human rights, and that the cost of keeping it, especially as regards public health, is so great as to be immeasurable such that the only solution is its abolition."⁷

⁵ Mr. Gayer and Mr. Woodward, along with some other parties, also argued that the Settlement Agreement should not be adopted on procedural grounds. *See* Decision No. 76295 at 8-20 for a summary of those arguments. In Decision No. 76295, we stated:

Having examined and considered all arguments made regarding procedural opposition to the settlement process that the parties to this proceeding undertook, we find that the arguments are without merit and pose no barrier to our consideration of the substance of the Settlement Agreement. We note the dissatisfaction of some parties with the outcome of the Settlement Agreement including the issues regarding non-AMI meters litigated in this proceeding. Given the large number of intervenors, and the broad range of interests they represent, it is understandable that a total consensus was not reached. However, there is no support in the record for a finding of impropriety in the settlement process, and the fact that an individual party did not have its position incorporated in the Settlement Agreement does not reflect a deficiency in the settlement process or the Settlement Agreement itself. Our forthcoming bifurcated Decision on the litigated issues regarding non-AMI meters will not revisit the issue of whether any alleged improprieties occurred.

Decision No. 76295 at 20.

⁶ Woodward Reply Closing Brief "Reply Br." at 7, citing to Hearing Exhibit Woodward-6 generally (Direct Testimony of Warren Woodward on the Settlement Agreement).

⁷ Woodward Reply Br. at 10, citing to Hearing Exhibit Woodward-1 generally (Direct Testimony of Warren Woodward) and Woodward-6 generally (Direct Testimony of Warren Woodward on the Settlement Agreement).

Mr. Woodward claims that use of AMI meters poses health risks; that the sections of APS's and Staff's Initial Closing Briefs discussing AMI meters are irrelevant; and that all AMI meters "must be removed at once for being a public health hazard."⁸ Mr. Woodward argues that APS is mistaken in its reliance on the 2014 Arizona Department of Health Services ("ADHS") study which Mr. Woodward contends is "a worthless fraud."⁹ Mr. Woodward argues that there is no federally developed national standard for safe levels of exposure to radiofrequency ("RF") energy;¹⁰ that 2 to 100 kilohertz frequencies are not regulated by the Federal Communications Commission ("FCC");¹¹ and that the ADHS study did not consider them, and could not have found them with the measuring device used in the study.¹² Mr. Woodward contends that APS's inability to reproduce the same measurements of electrical noise that Mr. Woodward's witness Erik Anderson described in his testimony¹³ was due to APS's lack of understanding "the basics about dirty electricity and its effect on human health."¹⁴ Mr. Woodward asserts that AMI meters emit kilohertz frequencies in the 2 to 50 range,¹⁵ and that those frequencies are biologically active and detrimental to human health.¹⁶ Mr. Woodward contends that APS's witness was "ignorant of the subject matter" and of APS's testing protocol.¹⁷ Mr. Woodward

⁸ Woodward Initial Closing Brief "Br." at 4-10; Woodward Reply Br. at 3. Mr. Woodward attached a DVD as Exhibit A to his Initial Closing Brief, and states that it constitutes "new evidence" "that proves 'smart' meters adversely affect the human heart." Woodward Br. at 5. Mr. Woodward also attached a DVD as Exhibit A to his Reply Closing Brief, stating that it is Part II of the Exhibit A attached to his Initial Closing Brief, and is "a longer, more comprehensive version of Part I with more testing and with two test subjects." Woodward Reply Br. at 3. The purpose of legal briefs is not to enter new evidence into the record, but to allow parties an opportunity to set forth their legal arguments on evidence presented in a proceeding. Exhibit A attached to Mr. Woodward's Initial Closing Brief and Exhibit A attached to Mr. Woodward's Reply Closing Brief do not constitute evidence subject to cross-examination of a sponsoring witness, and cannot be accorded any weight.

⁹ Woodward Br. at 8. A copy of the ADHS study Mr. Woodward refers to was included in Hearing Exhibit APS-10 (Rebuttal Testimony of APS witness Scott Bordenkircher on the Settlement Agreement) Attachment SBB-1SR, and a copy is attached hereto and incorporated herein as Exhibit B.

¹⁰ Woodward Br. at 7 and Woodward Reply Br. at 14, citing to Hearing Exhibit Woodward-6 (Direct Testimony of Warren Woodward on the Settlement Agreement) at 28 and Exhibit O, page 2 (July 16, 2002 letter from the United States Environmental Protection Agency ("EPA") to Ms. Janet Newton, President of The EMR Network).

¹¹ Woodward Br. at 9-10; Woodward Reply Br. at 13.

¹² Woodward Br. at 9-10.

¹³ Woodward Br. at 8, citing to Hearing Exhibit Woodward-4 generally (Direct Testimony of Erik S. Anderson, PE on the Settlement Agreement).

¹⁴ Woodward Br. at 8-9, referring to Hearing Exhibit APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement Agreement) at 9; Woodward Reply Br. at 13, citing to Tr. at 662, 663, 671, 740-42, 743, 754, 755.

¹⁵ Woodward Br. at 8, citing to Hearing Exhibit Woodward-4 generally (Direct Testimony of Erik S. Anderson, PE on the Settlement Agreement).

¹⁶ Woodward Br. at 8-9, citing to Hearing Exhibit Woodward-5 generally (Direct Testimony of Dr. Sam Milham, MD, MPH on the Settlement Agreement) and Tr. at 926 (Woodward witness Milham).

¹⁷ Woodward Br. at 9, citing to Tr., at 662-63, 740, 741, 743, 754, 755 (APS witness Bordenkircher).

1 disagrees with APS's contention that the testimony of Woodward witness Mr. Anderson demonstrates
 2 the absence of a causal link between AMI and health concerns, arguing that Mr. Anderson's admission
 3 that devices other than AMI meters that have switch power mode supplies can cause noise or dirty
 4 electricity has no bearing on his test results.¹⁸ Mr. Woodward acknowledges that there can be other
 5 sources of dirty electricity in a home, but argues that they "cause only temporary or intermittent
 6 exposure, and unlike the 'smart' meter, most of those sources can be avoided altogether;" "the 'smart'
 7 meter is at the gateway of electricity to the building or home;" and "the 'smart' meter is polluting the
 8 electricity for the entire building or home, 24/7/365."¹⁹

9 Mr. Woodward argues that APS's statement that no party offered evidence that customer
 10 information had been compromised evades the issue of Mr. Woodward's contention that AMI meters
 11 are surveillance devices,²⁰ and argues that "APS (or hackers) *can* in fact disaggregate 'smart' meter
 12 data and know how customers use electricity."²¹ Mr. Woodward discounts APS's statements regarding
 13 its concern for the security and privacy of its customers, arguing that "'privacy of customer
 14 information' is a ruse"²² and that the issue is "not whether APS actually uses the meter as a surveillance
 15 device, but if the meter has that capability."²³

16 Mr. Woodward asserts that AMI meters pose a cybersecurity risk.²⁴ Mr. Woodward is critical
 17 of APS's assertions regarding its experience in assessing and mitigating of cybersecurity risks and
 18 maintaining customer privacy.²⁵ Mr. Woodward argues that APS's statements regarding a lack of
 19 control over whether and how third-party bad actors attempts to engage in illegal activity, regardless
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22 ¹⁸ Woodward Reply Br. at 12.

¹⁹ *Id.* at 12-13.

23 ²⁰ Woodward Reply Br. at 10; Woodward Br. at 10, citing to Hearing Exhibit Woodward-6 (Direct Testimony of Warren
 24 Woodward on the Settlement Agreement) at 15-21. Mr. Woodward also cites to Exhibit D to his Initial Closing Brief.
 25 Woodward Br. at 10-11. The purpose of legal briefs is not to enter new evidence into the record, but to allow parties an
 opportunity to set forth their legal arguments on evidence presented in a proceeding. Exhibit D attached to Mr. Woodward's
 Initial Closing Brief does not constitute evidence subject to cross-examination of a sponsoring witness, and cannot be
 accorded any weight.

26 ²¹ Woodward Br. at 12 (emphasis in original).

²² Woodward Br. at 11.

²³ *Id.*

27 ²⁴ Woodward Br. at 12, citing to Hearing Exhibit Woodward-6 (Direct Testimony of Warren Woodward on the Settlement
 28 Agreement) at 21-23; Woodward Reply Br. t 11.

²⁵ Woodward Br. at 12-13.

1 of technology used, justify his position that customers should be allowed to take service using non-
2 AMI meters without paying additional fees.²⁶

3 Mr. Woodward asserts that fires and the threat of fires associated with AMI meters are a
4 legitimate, serious concern,²⁷ and that one fire in the APS service territory is currently being litigated
5 and the fire's cause has not been determined.²⁸ Mr. Woodward claims that AMI meters place high
6 frequency voltage transients on wiring, which presence could cause damage to, and interference with,
7 customers' appliances and electronics.²⁹ Mr. Woodward also contends that AMI meters are
8 inaccurate.³⁰ Mr. Woodward argues that AMI meters are "not just measuring devices, but also
9 computers, radio transceivers and relay antennas" and that the Internal Revenue Service classifies them
10 as computers.³¹ Mr. Woodward contends that "[p]lacement of a computer, radio transceiver and relay
11 antenna (of any size) on anyone's private property without permission or compensation is trespass and
12 theft."³²

13 Mr. Woodward claims that charging opt-out fees to customers who choose to take service using
14 non-AMI meters is discriminatory.³³ Mr. Woodward contends that APS has not tallied the cost of
15 serving customers with AMI, and states that its witness could not provide the yearly cost to achieve
16 AMI meter related savings.³⁴ Mr. Woodward argues that AMI opt-out fees would selectively apply the

18 ²⁶ *Id.* at 13, referring to Hearing Exhibit APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement Agreement) at 10.

19 ²⁷ Woodward Br. at 13-15, citing to Hearing Exhibit Woodward-6 (Direct Testimony of Warren Woodward on the Settlement Agreement) at 23-24 and Tr. at 784-85 (Woodward witness Anderson); Woodward Reply Br. at 12, citing to Tr. at 784 (Woodward witness Anderson).

20 ²⁸ Woodward Br. at 13, citing to Hearing Exhibit Woodward 3-3 (APS Supplemental Response to Woodward Data Request 2.15); Woodward Reply Br. at 11.

21 ²⁹ Woodward Br. at 15-16, citing to Hearing Exhibit Woodward-4 generally (Direct Testimony of Erik S. Anderson, PE on the Settlement Agreement) and Tr. at 784, 787 (Woodward witness Anderson).

22 ³⁰ Woodward Br. at 18-20, citing to Hearing Exhibit Woodward-6 generally (Direct Testimony of Warren Woodward on the Settlement Agreement).

23 ³¹ Woodward Br. at 13-18, citing to Hearing Exhibit Woodward-6 (Direct Testimony of Warren Woodward on the Settlement Agreement) at 26-27. Mr. Woodward also cites to Exhibit E to his Initial Closing Brief. Woodward Br. at 17. The purpose of legal briefs is not to enter new evidence into the record, but to allow parties an opportunity to set forth their legal arguments on evidence presented in a proceeding. Exhibit E attached to Mr. Woodward's Initial Closing Brief does not constitute evidence subject to cross-examination of a sponsoring witness, and cannot be accorded any weight.

24 ³² Woodward Br. at 18, citing to Hearing Exhibit Woodward-6 (Direct Testimony of Warren Woodward on the Settlement Agreement) at 26-27.

25 ³³ Woodward Br. at 20-29, citing to Hearing Exhibit Woodward-1 generally (Direct Testimony of Warren Woodward) and Hearing Exhibit Woodward-6 generally (Direct Testimony of Warren Woodward on the Settlement Agreement); Woodward Reply Br. at 19-22.

26 ³⁴ Woodward Reply Br. at 19, citing to Tr. at 659 (APS witness Bordenkircher).

1 cost causation principle, because APS does not charge customers for the provision of bi-lingual
 2 customer service, home energy checkups, or different customer communication preferences.³⁵ Mr.
 3 Woodward also argues that in locations that are too remote for an AMI meter, APS must have manual
 4 meter reading service available, and because APS does not charge customers for reading those non-
 5 AMI meters, it is discriminatory for APS to charge fees to customers who choose not to have an AMI
 6 meter.³⁶ Mr. Woodward disagrees with Staff's arguments that the \$5.00 monthly AMI Meter Opt-Out
 7 fee is a substantial discount from the real costs to serve customers who choose to Opt-Out due to
 8 foregone economies of scale.³⁷

9 Mr. Woodward argues that the interests of residential customers, small commercial customers,
 10 and DG solar customers in regard to the AMI Meter Opt-Out program were not represented by any
 11 other intervenors in this proceeding.³⁸ Mr. Woodward contends that Section 8.5 of APS Service
 12 Schedule 1, which would not allow customers who threaten APS employees to participate in the AMI
 13 Opt-Out program, is discriminatory;³⁹ that not including commercial customers in the AMI Opt-Out
 14 program is discriminatory, and not supported by APS's reasoning;⁴⁰ and that Section 8.3 of APS
 15 Service Schedule 1, which does not allow rooftop solar customers to participate in the AMI Opt-Out
 16 program, is discriminatory, because APS will allow customers in locations that are too remote for an
 17 AMI meter to have rooftop solar installations with a non-AMI meter.⁴¹

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23 ³⁵ Woodward Br. at 21-22, citing to Tr. at 146, 147, 148, 149 (APS witness Lockwood).

24 ³⁶ Woodward Br. at 26-27.

25 ³⁷ Woodward Reply Br. at 32-33. Mr. Woodward asserts that Staff's Initial Closing Brief quoted his statements regarding economies of scale out of context.

26 ³⁸ Woodward Reply Br. at 21-22.

27 ³⁹ Woodward Br. at 22-23, citing to Tr. at 149-52 (APS witness Lockwood).

28 ⁴⁰ Woodward Br. at 24-26, citing to Tr. at 155, 156 (APS witness Lockwood) and 587, 588 (APS witness Bordenkircher);

⁴¹ Woodward Br. at 27-29, citing to Tr. at 159, 160 (APS witness Lockwood), Tr. at 759 (APS witness Bordenkircher), Hearing Exhibit Woodward-1 (Direct Testimony of Warren Woodward) at Exhibit C, Hearing Exhibit Woodward-6 (Direct Testimony on the Settlement Agreement) at 11, Hearing Exhibit APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement Agreement) at 9, and Tr. at 755-58 (APS witness Bordenkircher).

1 Mr. Woodward disagrees with APS that AMI technology is a foundational component of a
 2 modern electrical grid,⁴² and contends that the costs of AMI meters outweigh their benefits.⁴³ Mr.
 3 Woodward asserts that benefits of AMI meters, such as providing usage information and usage alerts
 4 to customers, operational cost savings from remote meter reads, voltage control, reduced carbon
 5 emissions, and reduced energy theft and fraud, are unsubstantiated because APS did not provide a
 6 dollar amount for those benefits,⁴⁴ and because APS's witness did not know how many customers
 7 access their available usage information.⁴⁵ Mr. Woodward states that APS provided him with two
 8 cost/benefit studies, "but neither one was recent or based on actual real-life experience. They were
 9 simply studies - cost projections – from 2005 and 2008, well before APS's 'smart' meter installations
 10 began in earnest."⁴⁶ Mr. Woodward also argues, however, that "APS provided *absolutely no figures*
 11 whatsoever to back its claim that its 'smart' meters 'provide a multitude of benefits to customers that
 12 far outweigh the investment.'"⁴⁷ Mr. Woodward states that chose not to rebut the cost/benefit study
 13 provided by APS in a data response, because he "sees no value in wasting time to rebut inaccurate
 14 projections from 12 and 9 years ago," and that he relies instead on a slide from a Pinnacle West
 15 shareholder presentation, (introduced at hearing as Hearing Exhibit Woodward-10), which lists three
 16 AMI benefits to APS (one with dollar amounts) and two benefits to APS customers, to support his
 17 position that that the costs of AMI meters outweigh their benefits.⁴⁸ Referring to Hearing Exhibit
 18 Woodward-10, Mr. Woodward argues that it is reasonable to assume that the slide purported to be a
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 21 ⁴² Woodward Reply Br. at 4, citing to Hearing Exhibit Woodward-6 (Direct Testimony of Warren Woodward on the
 22 Settlement Agreement) Exh. B at 4 (Initial Comments filed on January 17, 2014 by NSTAR Electric Company and Western
 23 Massachusetts Electric Company ("Northeast Utilities") in response to the December 23, 2013 Straw Proposal issued by
 24 the Commonwealth of Massachusetts Department of Public Utilities in Docket D.P.U. 12-76-A *Investigation by the
 Department of Public Utilities on its own Motion into Modernization of the Electric Grid*) (Northeast Utilities' filed
 comments state: "An Advance Metering System is not a 'basic technology platform' for grid modernization and is not
 needed to realize 'all of the benefits of grid modernization.'"(emphasis in original)).

25 ⁴³ Woodward Br. at 29, citing to Hearing Exhibit Woodward-6 (Direct Testimony of Warren Woodward on the Settlement
 Agreement) at 38-46.

26 ⁴⁴ Woodward Reply Br. at 17; Woodward Br. at 29-33, citing to Tr. at 604, 605, 656, 657, 658, 659, 663 (APS witness
 Bordenkircher); Woodward Reply Br. at 5-6, 15. In his Reply Closing Brief, Mr. Woodward referred to a 55 page study
 released April 28, 2017 for PG&E in California. The study was not presented at the hearing, does not constitute evidence
 subject to cross-examination of a sponsoring witness, and cannot be accorded any weight.

27 ⁴⁵ Woodward Reply Br. at 20, citing to Tr. at 606, 655, 656 (APS witness Bordenkircher).

28 ⁴⁶ Woodward Reply Br. at 15.

⁴⁷ *Id.* at 17 (emphasis in original).

⁴⁸ Woodward Reply Br. at 16, referring to Hearing Exhibit Woodward-10.

comprehensive conclusion on the benefits of AMI.⁴⁹ Mr. Woodward asserts that customers have had to bear the costs of replacing defective meters that were not under warranty.⁵⁰

Mr. Woodward asserts that Staff failed to comply with Decision No. 75047.⁵¹ Mr. Woodward is dismissive of Staff's reliance on the testimony of APS's witnesses, which Mr. Woodward claims was unsubstantiated,⁵² and of Staff's reliance on the testimony of its own witness.⁵³ Mr. Woodward contends that he, and not Staff or APS, has provided the comprehensive review contemplated by Decision No. 75047 of the issues related to APS's Proposed Automated Meter Opt-Out Service Schedule.⁵⁴

Mr. Woodward disputes APS's statements that the Commission has found the Company's AMI meter investments to be reasonable and prudent in Decision No. 71448 (December 30, 2009) and Decision No. 73183 (May 24, 2012). Mr. Woodward asserts that "no place in those Decisions are APS's 'smart' meter investments deemed 'reasonable and prudent,'" and contends that consequently, APS's reliance on Decision Nos. 71448 and 73183 for those statements "misrepresented" those Decisions.⁵⁵ Mr. Woodward also states that he never saw the study "to support costs of various charges in Service Schedule 1, taking into account the impact Smart Grid technology may have on the costs" ordered by Decision No. 73183.⁵⁶ He also argues that Decision No. 73183's requirement for AMI meters as a condition of service under the AG-1 Experimental Rate Rider for large industrial customers "is at odds with APS's statement that 'APS decided to move to AMI meters and the standard meter offering more than a decade ago.'"⁵⁷ Mr. Woodward argues that "the only ACC Decision worth citing

⁴⁹ *Id.*

⁵⁰ Woodward Reply Br. at 37-38; Woodward Br. at 32-33, citing to Hearing Exhibit Woodward 3-1, p. 2 and Hearing Exhibit Gayer-15, p. 2.

⁵¹ Woodward Reply Br. at 34-39; Woodward Br. at 38, referring to Findings of Fact No. 23.h of Decision No. 75047 (at page 4). Findings of Fact No. 23 directed APS to provide information in this rate case for the Commission's evaluation. Decision No. 75047 included no compliance items for Staff.

⁵² Woodward Reply Br. at 35-37.

⁵³ *Id.* at 38-39.

⁵⁴ Woodward Br. at 42-43, referring to Findings of Fact Nos. 6, 16, and 17 of Decision No. 75047 (at pages 2, 3).

⁵⁵ Woodward Br. at 7-9.

⁵⁶ *Id.* at 8-9, citing to Decision No. 73183 at 16.

⁵⁷ Woodward Reply Br. at 9.

1 regarding the ‘smart’ meter legitimacy that APS seems to be seeking is ACC Decision # 69736, a 2007
2 decision that made ‘smart’ meters voluntary, not mandatory, and not a ‘standard meter.’”⁵⁸

3 **b. Mr. Gayer**

4 Mr. Gayer contends that AMI meters are dangerous devices that expose both APS and its
5 customers to the risk of cyber attacks, house fires caused by internal meter defects,⁵⁹ danger to
6 customers’ health,⁶⁰ and invasion of privacy.⁶¹ Mr. Gayer argues that the ADHS study found only that
7 AMI meters were not likely to harm public health, and not that they are actually safe.⁶² Mr. Gayer
8 asserts that APS’s AMI system could lead to a sudden system failure, after which “[m]illions of people
9 will be without power for weeks if not longer, and the sudden impact on our economy will be a crippling
10 disaster approaching that of a nuclear war or asteroid strike.”⁶³ Mr. Gayer proposes that APS be
11 prohibited from installing more AMI meters, or replacing them with another AMI meter, until APS
12 establishes that AMI meters do not “expose any customer to potentially harmful radiation, to a cyber
13 attack . . . or to a house fire . . .”⁶⁴

14 Mr. Gayer argues that APS “utterly disregards the well-being of its customers who are at the
15 mercy of APS equipment, including smart meters” and that it has therefore not demonstrated that the
16 benefits of AMI meters outweigh their costs.⁶⁵ Mr. Gayer is critical of APS’s reliance on the testimony
17 of its witness for its position that AMI provides customer benefits, and claims that APS ignores his
18 specific proposals.⁶⁶ Mr. Gayer also argues that charging customers who Opt-Out of having an AMI
19 meter for manually reading their meter would constitute discriminatory treatment in violation of A.R.S.
20 § 40-334.⁶⁷ Mr. Gayer therefore proposes that the costs of reading non-AMI meters be spread among

21 ⁵⁸ *Id.* at 9, referring to Hearing Exhibit Woodward-6 (Direct Testimony of Warren Woodward on the Settlement
22 Agreement) at 36-37.

23 ⁵⁹ Gayer Reply Br. at 5.

24 ⁶⁰ *Id.* at 5-6.

25 ⁶¹ Gayer Br. at 12-14, referring to Woodward Initial Closing Brief, generally; Gayer Reply Br. at 2, 4-5.

26 ⁶² Gayer Reply Br. at 6.

27 ⁶³ *Id.* at 2. Mr. Gayer cites in his Reply Closing Brief to his transcription of a YouTube video interview, and to a news
28 broadcast he indicates is available on his own blog as support for his assertions regarding grid security. *See* Gayer Reply
Br. at 2-3. The purpose of legal briefs is not to enter new evidence into the record, but to allow parties an opportunity to
set forth their legal arguments on evidence presented in a proceeding. These cited sources were not introduced at the
hearing, do not constitute evidence subject to cross-examination, and cannot be accorded any weight.

⁶⁴ Gayer Br. at 10, Reply Br. at 16.

⁶⁵ Gayer Reply Br. at 6.

⁶⁶ *Id.* at 3-4.

⁶⁷ Gayer Br. at 6-7; Gayer Reply Br. at 6. A.R.S. § 40-334 provides as follows:

1 all APS customers.⁶⁸ Mr. Gayer also proposes that if the AZ Sun II proposal is approved, the
 2 Commission order that all of APS's customers share the cost of reading non-AMI meters.⁶⁹ In the
 3 alternative, Mr. Gayer proposes that customers with non-AMI meters be allowed to submit a self-
 4 reading of their meters pursuant to Arizona Administrative Code ("A.A.C.") R14-2-209.A, or that APS
 5 use bill estimation for those customers.⁷⁰

6 Mr. Gayer also proposes that if APS has in the past read a customer's meter without physical
 7 access to the meter (such as with binoculars), that APS not be permitted to have physical access to that
 8 meter, or to its replacement, for reading purposes.⁷¹ Mr. Gayer contends that APS has no need to read
 9 personal data from a customer's meter,⁷² and that "a physical intrusion is unnecessary when an analog
 10 or digital meter can be read and has been read for years without any physical intrusion."⁷³ Mr. Gayer
 11 asserts that in the event APS personnel enter on his property to read the non-AMI meter pursuant to an
 12 approved Opt-Out program tariff, he will file a claim against APS every month in justice court for
 13 "unnecessary physical trespass onto his property" and "for literally stealing his private and personal
 14 information from the digital meter." Mr. Gayer contends that "no tariff can supersede the common law
 15 of privacy or the Constitutional right of privacy."⁷⁴

16 ...

17 ...

19 40-334. Discrimination between persons, localities or classes of service as to rates, charges, service or
 facilities prohibited

20 A. A public service corporation shall not, as to rates, charges, service, facilities or in any other respect,
 21 make or grant any preference or advantage to any person or subject any person to any prejudice or
 disadvantage.

22 B. No public service corporation shall establish or maintain any unreasonable difference as to rates,
 charges, service, facilities or in any other respect, either between localities or between classes of service.

23 C. The commission may determine any question of fact arising under this section.

24 ⁶⁸ Gayer Br. at 6, 16; Gayer Reply Br. at 6, 9.

⁶⁹ Gayer Br. at 15, 16; Gayer Reply Br. at 10. Decision No. 76295 approved the AZ Sun II program as proposed by the
 Settling Parties.

⁷⁰ Gayer Br. at 7-8; Gayer Reply Br. at 9.

⁷¹ Gayer Br. at 8, 14, 16; Gayer Reply Br. at 9.

⁷² Gayer Reply Br. at 4-5. Mr. Gayer cites in his Reply Closing Brief to two news broadcasts as support for his assertions
 regarding data security and privacy. See Gayer Reply Br. at 2-3. The purpose of legal briefs is not to enter new evidence
 into the record, but to allow parties an opportunity to set forth their legal arguments on evidence presented in a proceeding.
 These cited sources were not introduced at the hearing, do not constitute evidence subject to cross-examination, and cannot
 be accorded any weight.

⁷³ Gayer Br. at 14.

⁷⁴ *Id.*

1 **c. APS**

2 APS states that its standard meter is the AMI meter, and that AMI technology is “a foundational
3 component of a modern electrical grid and critical for the Company to plan for and continue providing
4 safe and reliable service.”⁷⁵ APS asserts that the AMI Opt-Out program proposed in the Settlement
5 Agreement is in the public interest, and that the optional provision of a non-AMI digital meter⁷⁶
6 provides a reasonable way to meet the desires of those few customers who do not wish to be served
7 with a standard meter, while preserving the significant benefits of AMI for APS’s customers.⁷⁷

8 APS states that AMI makes day-to-day grid operations visible, allows system operators to better
9 assess reliability concerns, and permits increased efficiency and improved reliability.⁷⁸ APS states that
10 in order for electric utilities, including APS, to integrate DG, energy storage, and demand response into
11 its system, it must be able to accurately and timely understand their effects on the system, and to
12 manage and plan system voltage and power quality to mitigate their impacts to system reliability.⁷⁹
13 APS states that the information provided by AMI is vital to its operations, because it provides system
14 operators critical information for efficient and reliable system operation.⁸⁰ APS explains that it is for
15 these reasons that the Settlement Agreement does not allow DG customers to Opt-Out,⁸¹ and that while
16 numerous parties representing solar interests are parties to this case, none voiced opposition to the AMI
17 Opt-Out program or advocated that it be available for DG customers.⁸² APS explains that similarly,
18 commercial customers are excluded from the AMI Opt-Out program because losing large gaps in data
19 from larger commercial customers has the potential to adversely impact overall system reliability,
20 including equipment overloads.⁸³ APS asserts that AMI better serves small commercial customers with
21

22 ⁷⁵ APS Br. at 43, referring to Hearing Exhibit APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement
Agreement) at 4.

23 ⁷⁶ APS’s witness testified that mechanical meters are obsolete and no longer sold by reputable manufacturers. Tr. at 749-
50 and 765-66 (APS witness Bordenkircher).

24 ⁷⁷ APS Br. at 44, 46.

25 ⁷⁸ *Id.* at 44-45, citing to Tr. at 584 (APS witness Bordenkircher), and referring to Hearing Exhibit APS-10 (Rebuttal
Testimony of Scott Bordenkircher on the Settlement Agreement) at 3, 4.

26 ⁷⁹ APS Br. at 44, citing to Tr. at 1037 (Staff witness Smith), and referring to Hearing Exhibit APS-10 (Rebuttal Testimony
of Scott Bordenkircher on the Settlement Agreement) at 3, 4, 7, and to Hearing Exhibit APS-14 (Direct Testimony of Daniel
Froetscher) at 11; APS Br. at 51-52.

27 ⁸⁰ APS Br. at 51.

28 ⁸¹ *Id.*, citing to Tr. at 587 (APS witness Bordenkircher); APS Br. at 52, citing to Tr. at 159-60 (APS witness Lockwood).

⁸² APS Br. at 52.

⁸³ *Id.* at 50, citing to Tr. at 588 (APS witness Bordenkircher).

1 remote turn on and turn off for their frequent change outs, and with the provision of information that
 2 business customers often want to manage their businesses.⁸⁴ APS states that twelve of the Settling
 3 Parties represent commercial or industrial interests, and none opposed exclusion of commercial
 4 customers from opt-out eligibility.⁸⁵

5 APS contends that the AMI Opt-Out program's eligibility limitations are reasonable based on
 6 customer differences, and not discriminatory under A.R.S. § 40-334; and that because the AMI Opt-
 7 Out program is cost-based, it is therefore not discriminatory to charge residential customers a fee for
 8 participation, as Mr. Woodward and Mr. Gayer allege.⁸⁶ When customers choose to participate in the
 9 AMI Opt-Out program, APS incurs more costs to provide the same level of service that APS provides
 10 to customers with standard AMI metering.⁸⁷ In response to Mr. Gayer's position that the costs of the
 11 AMI Opt-Out program should be spread across all customers, APS states that the Settlement
 12 Agreement proposed fees do socialize more than two-thirds of the costs, but that the Settling Parties
 13 agreed that customers who choose to Opt-Out should pay some of the costs of doing so.⁸⁸

14 In addition to benefits to the system that AMI provides, APS states that AMI also provides
 15 direct benefits to customers.⁸⁹ Having usage information made available by AMI allows customers the
 16 opportunity to gain more control over their energy usage. APS states that customer access to AMI data
 17 will grow as more and more functionality becomes available.⁹⁰ APS states that thanks to AMI
 18 metering, many functions that formerly had to be handled manually, with physical site visits, such as
 19 service connections, disconnections, or rate plan changes, can now be performed remotely.⁹¹ APS
 20 states that AMI meters lower operating costs, which leads to lower customer rates,⁹² and that they
 21 provide the Company with the ability to measure power quality, which ensures that electricity delivered
 22

23
 24 ⁸⁴ APS Br. at 51, citing to Tr. at 155 (APS witness Lockwood).

25 ⁸⁵ APS Br. at 51.

26 ⁸⁶ *Id.* at 46, 50.

27 ⁸⁷ APS Br. at 50.

28 ⁸⁸ *Id.* at 13.

⁸⁹ APS Br. at 45-46, citing to Tr. at 604, 605, 606, 636-37 (APS witness Bordenkircher), and referring to Hearing Exhibit
 APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement Agreement) at 3, 4.

⁹⁰ APS Br. at 45.

⁹¹ *Id.*, citing to Tr. at 604-605 (APS witness Bordenkircher).

⁹² APS Br. at 45, citing to Tr. at 605-606 (APS witness Bordenkircher).

1 to customers is within the correct voltage range.⁹³ AMI meters transmit a signal to indicate meter
 2 tampering, so that APS can reduce energy theft and fraud, and remotely metered functions also reduce
 3 truck rolls, leading to decreased carbon emissions.⁹⁴

4 APS asserts that the benefits of AMI far outweigh the costs,⁹⁵ and that as Mr. Woodward
 5 acknowledged, APS provided him with a cost/benefit study on APS's AMI metering in a data
 6 response.⁹⁶ APS states that the study demonstrated a positive present value for AMI,⁹⁷ and that Mr.
 7 Woodward did not use or cite the study.⁹⁸ APS is critical of Mr. Woodward's reliance instead on
 8 Hearing Exhibit Woodward-10, which does not address APS's cost savings from not manually reading
 9 meters, reductions in energy theft, or remote changes to billing plans, but includes dollar amounts only
 10 for APS's cost savings from avoided field orders to connect or disconnect meters.⁹⁹

11 APS states that it takes the privacy and security of its customers seriously; that it complies
 12 with all Commission regulations, approved rate and service schedules, state statutes, and federal
 13 regulations regarding privacy and security of customer information; that no evidence was presented
 14 that any customer information had been compromised; and that APS takes all necessary precautions to
 15 maintain the security and privacy of its customers with and without AMI.¹⁰⁰ APS's witness testified
 16 that APS has been maintaining the cyber security of its critical systems and its customers' privacy for
 17 decades; that it has extensive experience in this area; and that it carefully assesses and mitigates
 18 cybersecurity risks.¹⁰¹ APS asserts that its security model is consistent with best industry practices,
 19 and that its practices are constantly reviewed both internally and by third parties, and updated as
 20 necessary to protect against emerging threats.¹⁰²

21
 22 ⁹³ APS Br. at 46, referring to Hearing Exhibit APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement Agreement) at 3.

23 ⁹⁴ APS Br. at 46, citing to Tr. at 606 (APS witness Bordenkircher) and referring to Hearing Exhibit APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement Agreement) at 3-4 and Tr. at 636-37 (APS witness Bordenkircher).

24 ⁹⁵ APS Br. at 49.

25 ⁹⁶ *Id.*, citing to Tr. at 974-75.

26 ⁹⁷ APS Br. at 49.

27 ⁹⁸ *Id.* See also Woodward Reply Br. at 16.

28 ⁹⁹ APS Br. at 49, citing to Tr. at 970-71; see also Hearing Exhibit Woodward-10.

¹⁰⁰ APS Br. at 47, referring to Hearing Exhibit APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement Agreement) at 3-4.

¹⁰¹ Hearing Exhibit APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement Agreement) at 5.

¹⁰² APS Br. at 47, referring to Hearing Exhibit APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement Agreement) at 5.

1 APS disputes arguments that AMI meters have caused fires in its service territory, stating that
 2 of the 12 fires alleged to have been caused by APS installed Elster AMI meters, APS's analysis has
 3 determined that the root cause of the fire was external to the meter itself, such as broken or loose meter
 4 clips or defective wiring at the location.¹⁰³ APS's witness testified that for the meter that is the subject
 5 of ongoing litigation (from which APS has been dismissed), APS's analysis determined that the root
 6 cause of the fire was not the meter.¹⁰⁴

7 In regard to allegations regarding adverse health effects through "noise" on electrical
 8 wavelengths and dirty electricity, APS contends that the testimony of Mr. Woodward's own witnesses
 9 demonstrates the lack of a causal link between AMI and health concerns.¹⁰⁵ APS points out that Mr.
 10 Woodward's witness Mr. Anderson testified that there are many different types of things that can cause
 11 noise on the line, and that any electronic device with a switch mode power supply can cause noise
 12 similar to an AMI meter.¹⁰⁶ In addition, APS states, Mr. Woodward's witness Dr. Milham testified
 13 that may household electronics cause the same health issues as AMI.¹⁰⁷ APS points out that Mr.
 14 Woodward's witness Dr. Milham testified that "all our modern electronic junk runs on DC, every
 15 computer, the little chargers for your cell phone" and have health issues, and that compact fluorescent
 16 lights, variable frequency drives, variable speed pool pumps, and variable speed motors on air
 17 conditioners are bad for health.¹⁰⁸

18 APS asserts that the RF used by AMI is regulated by the FCC, and its AMI meters meet
 19 applicable Federal standards.¹⁰⁹ APS points out that the Commission has performed an inquiry
 20 regarding the health, safety, and functionality of advanced meters in Commission Docket No. E-
 21 00000C-11-0328, and in the course of that inquiry, requested that ADHS conduct a study.¹¹⁰ APS
 22
 23

24 ¹⁰³ APS Br. at 47-48, citing to Tr. at 666 (APS witness Bordenkircher) and referring to Hearing Exhibit APS-10 (Rebuttal
 25 Testimony of Scott Bordenkircher on the Settlement Agreement) at 5. *See also* Tr. at 668 (APS witness Bordenkircher).

¹⁰⁴ Tr. at 668 (APS witness Bordenkircher).

¹⁰⁵ APS Br. at 48.

¹⁰⁶ *Id.*, citing to Tr. at 790, 791 (Woodward witness Anderson).

¹⁰⁷ APS Br. at 48, citing to Tr. at 945-46 (Woodward witness Milham).

¹⁰⁸ *Id.* *See also* Tr. at 944 (Woodward witness Milham).

¹⁰⁹ APS Br. at 48; APS Reply Br. at 12.

¹¹⁰ APS Br. at 49. That study is attached to this Decision as Exhibit B.

1 states that the subsequent 2014 study conducted by ADHS concluded that the advanced meters in use
2 in Arizona were operating within FCC standards and were not likely to harm human health.¹¹¹

3 **d. Staff**

4 Staff asserts that the AMI Opt-Out program proposed in the Settlement Agreement provides an
5 appropriate balance of the interests of ratepayers who believe AMI metering is unsafe with the interests
6 of other ratepayers and the Company, which has extensively deployed AMI metering.¹¹² Staff states
7 that the record in this proceeding demonstrates that conversion to AMI metering provides many
8 customer benefits, including the availability to customers of detailed usage data that gives them more
9 control over their bills and more opportunities to save money; a lowering of APS's costs to serve related
10 to meter reads, customer move-ins / move-outs and remote billing rate changes; and providing a means
11 for the Company to provide its customers with proper voltage and observe attempted meter
12 tampering.¹¹³ Staff notes that in addition to the benefits that AMI meters provide, there are costs
13 associated with the use of non-AMI meters, such as the loss of economies of scale associated with the
14 need to manually read and maintain the alternative meters, as acknowledged by Mr. Woodward, and
15 that the Settlement Agreement proposed fees for the AMI Opt-Out program are therefore appropriate
16 and reasonable.¹¹⁴

17 Staff states that the Settlement Agreement's reduction from APS's originally proposed \$15
18 cost-based monthly fee for the use of discontinued legacy metering infrastructure, down to the modest
19 \$5 monthly fee, provides customers who Opt-Out with the benefit of a substantial discount from the
20 real costs to serve them.¹¹⁵ Staff asserts that requiring customers who subscribe to the AMI Opt-Out
21 program to pay part of the increased costs caused by the non-standard metering program does not
22 constitute an unreasonable difference in rates, and therefore is not discriminatory, as Mr. Gayer and
23 Mr. Woodward contend, but that instead, they will actually be subsidized by other ratepayers.¹¹⁶ Staff

24 ¹¹¹ APS Br. at 49.

25 ¹¹² Staff Reply Br. at 12.

26 ¹¹³ Staff Br. at 25, citing to Hearing Exhibit APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement Agreement) at 3-4; Staff Reply Br. at 12, citing to Hearing Exhibit APS-10 (Rebuttal Testimony of Scott Bordenkircher on the Settlement Agreement) at 3, 6.

27 ¹¹⁴ Staff Br. at 13, 25; citing to Tr. at 960-61 (Woodward).

28 ¹¹⁵ Staff Br. at 13, 14 citing to Tr. at 259 (APS witness Lockwood).

¹¹⁶ Staff Reply Br. at 13-14; Staff Reply Br. at 16, referencing A. R.S. § 40-334 and *City of Tucson v. Clear Channel Outdoor, Inc.* 218 Ariz. 172, 181 P.3d 219 (App. 2008).

1 also responds to Mr. Woodward's arguments that because some APS service locations are too remote
2 for the deployment of AMI meters, it is discriminatory for APS to charge customers in the Opt-Out
3 program, or to require customers with rooftop solar to have an AMI meter. Staff asserts that the
4 comparisons are inapposite, because it is beyond the control of remotely located customers whether to
5 use an AMI meter, and because the billing paradigm for solar customers requires that they be served
6 by an AMI meter.¹¹⁷

7 **IV. RESOLUTION**

8 After a full consideration of the record evidence and legal arguments presented, we find that
9 the AMI Opt-Out program as set forth in Section 30 and Schedule M of the Settlement Agreement
10 should be adopted. Its adoption results in a fair and reasonable balancing of the interests of all of APS's
11 ratepayers and the utility, and serves the public interest. The evidence presented does not support
12 allegations that AMI meters pose a risk to public safety or health beyond those risks inherent to the
13 delivery of electricity to homes and businesses, and those inherent to the use and enjoyment of modern
14 electrical appliances and conveniences in those homes and businesses. APS's AMI meters comply
15 with applicable safety standards. While allegations were made regarding increased fire risks, customer
16 privacy and security risks, and cyber security risks in association with the use of AMI meters, the
17 evidence presented does not support those claims.

18 The AMI Opt-Out program as set forth in Section 30 and Schedule M of the Settlement
19 Agreement provides a means for those APS customers who do not wish to receive service with APS's
20 standard AMI meter, for whatever reason, to request a non-AMI meter for a one-time installation fee
21 and a monthly fee, both of which are cost-based. We find no support in the record for allegations made
22 in this proceeding that the proposed fees or requirements for participation in this optional program are
23 discriminatory. The evidence presented demonstrates that the fees proposed by the Settling Parties for
24 the non-standard service provided under the voluntary AMI Opt-Out program are reasonable and
25 appropriate, and that the requirements for participation proposed by the Settling Parties for the non-

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28 ¹¹⁷ Staff Br. at 14.

1 standard service provided under the voluntary AMI Opt-Out program are also reasonable and
2 appropriate.

3 * * * * *

4 Having considered the entire record herein and being fully advised in the premises, the
5 Commission finds, concludes, and orders that:

6 **FINDINGS OF FACT**

7 **Procedural History**

8 1. APS, which is the largest subsidiary of Pinnacle West Capital Corporation (“Pinnacle
9 West”), is the largest electric provider in Arizona, and serves more than 1.2 million customers, in 11
10 of Arizona’s 15 counties. APS employs more than 6,300 employees, including employees at jointly-
11 owned generating facilities for which APS serves as the generating facilities manager. In addition to
12 the Palo Verde Nuclear Generating Station, which APS co-owns and operates, APS owns and operates
13 six natural gas plants, two coal-fired plants, and renewable energy power generating facilities. APS
14 currently generates approximately 11 percent of its electricity from more than 1,200 MW of renewable
15 resources. APS also owns and operates more than 35,000 miles of transmission and distribution lines
16 to deliver energy to its customers.

17 2. On January 29, 2016, APS filed a Notice of Intent to File a Rate Case Application and
18 Request to Open Docket.

19 3. On February 5, 2016, Richard Gayer, Patricia Ferré and Warren Woodward each filed
20 a Motion to Intervene.

21 4. On February 17, 2016, by Procedural Order, Richard Gayer, Patricia Ferré and Warren
22 Woodward were granted intervention.

23 5. On February 22 and March 7, 2016, Mr. Woodward filed comments in the docket.

24 6. On February 23, 2016, Mr. Gayer filed a Notice of Consent to Email Service.

25 7. On February 29, 2016, Mr. Woodward filed a Notice of Consent to Email Service.

26 8. On February 29, 2016, IO filed a Motion to Intervene.

27 9. On March 7, 2016, Mr. Woodward filed comments in the docket.

28 10. On March 21, 2016, a Procedural Order was issued granting intervention to IO and

1 granting requests to receive service by email.

2 11. On April 4, 2016, Freeport and AECC jointly filed a Motion to Intervene and Consent
3 to Email Service.

4 12. On April 21, 2016, a Procedural Order was issued granting intervention to Freeport and
5 AECC and granting requests to receive service by email.

6 13. On May 27, 2016, SCHOA filed a Motion to Intervene and a Consent to Email Service.

7 14. On June 1, 2016, APS filed the Application.

8 15. On June 3, 2016, WRA filed a Motion for Leave to Intervene and a Consent to Email
9 Service.

10 16. On June 7, 2016, AIC filed a Motion for Leave to Intervene and a Consent to Email
11 Service.

12 17. On June 14, 2016, APS filed a Notice of Errata.

13 18. On June 14, 2016, AURA filed a Motion for Leave to Intervene and Consent to Email
14 Service.

15 19. On June 14, 2016, a Procedural Order was issued granting interventions to SCHOA,
16 WRA and AIC and granting requests to receive service by email.

17 20. On June 15, 2016, PORA filed an Application to Intervene and a Consent to Email
18 Service.

19 21. On June 16, 2016, AriSEIA filed its Application to Intervene and a Consent to Email
20 Service.

21 22. On June 16, 2016, ASBA/AASBO jointly filed a Motion for Leave to Intervene.

22 23. On June 17, 2016, SCHOA filed a Clarification.

23 24. On June 17, 2016, Cynthia Zwick, in her individual capacity, and ACAA jointly filed a
24 Motion for Leave to Intervene. ACAA also filed a Consent to Email Service.

25 25. On June 17, 2016, APS filed its Opposition to AURA's Motion for Leave to Intervene.

26 26. On June 22, 2016, RUCO filed a Motion for Leave to Intervene.

27 27. On June 22, 2016, APS docketed copies of its lead/lag study and excerpts from the
28 Handy-Whitman Bulletin No. 182 used to calculate its proposed reconstruction cost new less

1 depreciation ("RCND") rate base.

2 28. On June 22, 2016, SWEEP filed a Motion for Leave to Intervene and a Consent to Email
3 Service.

4 29. On June 23, 2016, APS filed its Second Notice of Errata.

5 30. On June 24, 2016, AURA filed its Response in Support of Motion to Intervene.

6 31. On June 24, 2016, APS filed a copy of the notice it provided to parties of record of the
7 Rate Case Technical Conferences scheduled for July 20, 2016, August 23, 2016, September 29, 2016,
8 and October 26, 2016.

9 32. On June 27, 2016, Vote Solar filed a Motion for Leave to Intervene and a Consent to
10 Email Service.

11 33. On June 28, 2016, APS filed its Reply in Opposition to AURA's Motion to Intervene.

12 34. On June 29, 2016, the ED8/McMullen jointly filed a Motion for Leave to Intervene and
13 a Consent to Email Service.

14 35. On July 1, 2016, Staff issued a Letter of Sufficiency pursuant to A.A.C. R14-2-103,
15 classifying APS as a Class A utility.

16 36. On July 1, 2016, AURA filed a Motion to Strike.

17 37. On July 5, 2016, Kroger filed a Motion for Leave to Intervene and a Consent to Email
18 Service.

19 38. On July 5, 2016, John William Moore, Jr., filed with the Commission a Motion to
20 Associate Counsel *Pro Hac Vice* to associate Kurt J. Boehm and Jody Kyler Cohn as counsel for Kroger
21 in this matter.

22 39. On July 5, 2016, APS filed its Reply in Opposition to AURA's Motion to Strike.

23 40. July 6, 2016, AURA filed its Response to APS's Reply in Opposition to AURA's
24 Motion to Strike.

25 41. On July 7, 2016, TEP filed a Motion for Leave to Intervene and a Consent to Email
26 Service.

27 42. On July 8, 2016, Pima County filed a Motion for Leave to Intervene and a Consent to
28 Email Service.

- 1 43. On July 11, 2016, Staff filed a Request for Procedural Schedule.
- 2 44. On July 12, 2016, SEIA filed a Motion for Leave to Intervene and a Consent to Email
3 Service.
- 4 45. On July 15, 2016, EFCA filed a Motion to Intervene.
- 5 46. On July 18, 2016 Walmart filed an Application for Leave to Intervene and a Consent to
6 Email Service.
- 7 47. On July 19, 2016, Staff filed a Motion to Consolidate, requesting that the Rate
8 Application docket be consolidated with Docket No. E-01345A-16-0123.
- 9 48. On July 22, 2017, APS filed a copy of the presentation from its second Rate Case
10 Technical Conference.
- 11 49. On July 22, 2016, a Rate Case Procedural Order was issued setting the procedural
12 schedule and associated procedural deadlines for this matter, granting intervention to AURA, PORA,
13 AriSEIA, ASBA/AASBO, Cynthia Zwick (in her personal capacity), ACAA, SWEEP, RUCO, Vote
14 Solar, ED8/McMullen, Kroger, TEP, Pima County and SEIA, and granting several requests to receive
15 service by email.
- 16 50. On July 28, 2016, Mr. Woodward filed a Motion for Reconsideration of the July 22,
17 2016 Procedural Order.
- 18 51. On July 29, 2016, the IBEW Locals filed an Application for Leave to Intervene.
- 19 52. On August 1, 2016, a Procedural Order was issued granting Staff's request to
20 consolidate the above-captioned dockets, correcting typographical errors in the July 22, 2016 Rate Case
21 Procedural Order, granting interventions to EFCA and Walmart, and granting requests to receive
22 service by email.
- 23 53. On August 1, 2016, Mr. Woodward filed comments.
- 24 54. On August 1, 2016, Noble Solutions filed an Application for Leave to Intervene.
- 25 55. On August 3, 2016, the Alliance filed an Application for Leave to Intervene.
- 26 56. On August 3, 2016, FEA filed a Motion for Leave to Intervene.
- 27 57. On August 3, 2016, Karen S. White filed with the Commission a Motion to Associate
28 Counsel *Pro Hac Vice* to associate Thomas A. Jernigan as counsel for FEA in this matter.

1 58. On August 5, 2016, APS filed a Motion for Clarification and Extension of Time.

2 59. On August 9, 2016, a Procedural Order was issued granting APS's Motion for
3 Clarification and Extension of Time. The Procedural Order also granted intervention to the IBEW
4 Locals, Noble Solutions, and the Alliance, and approved a consent to email service.

5 60. On August 11, 2016, EFCA filed a Consent to Service by Email.

6 61. On August 15, 2016, Staff filed a Consent to Email Service.

7 62. On August 17, 2016, Noble Solutions filed a Consent to Email Service.

8 63. On August 24, 2016, APS filed a copy of the presentation from its second Rate Case
9 Technical Conference.

10 64. On August 24, 2016, the Districts jointly filed an Application for Leave to Intervene
11 and a Consent to Email Service.

12 65. On August 25, 2016, Correspondence from Commissioner Bob Burns was filed in the
13 docket.

14 66. On September 6, 2016, a Procedural Order was issued granting the Districts'
15 Application for Leave to Intervene, and granting requests for service by email.

16 67. On September 6, 2016, CNE filed an Application for Leave to Intervene.

17 68. On September 6, 2016, Mr. Woodward filed two sets of comments.

18 69. On September 9, 2016, APS filed Correspondence regarding subpoenas dated August
19 25, 2016.

20 70. On September 9, 2016, APS filed a Motion to Sever.

21 71. On September 9, 2016, APS filed a Motion to Quash, or in the Alternative, to Decline
22 to Hear.

23 72. On September 12, 2016, APS filed Correspondence regarding subpoenas dated August
24 25, 2016.

25 73. On September 13, 2016, APS filed an Affidavit of Publication and Proof of Mailing.

26 74. On September 13, 2016, Correspondence from Commissioner Bob Burns was filed in
27 the docket.

28 75. On September 27, 2016, Karen S. White filed a Motion to Associate Counsel *Pro Hac*

1 Vice to associate Thomas A. Jernigan as counsel for FEA in this matter pursuant to Arizona Supreme
2 Court Rule 38(a), to which was attached a certification of service indicating that the Motion was served
3 on all parties.

4 76. On September 30, 2016, Direct Energy filed an Application for Leave to Intervene.

5 77. On September 30, 2016, APS filed a copy of the presentation from its third Rate Case
6 Technical Conference.

7 78. On October 3, 2016, Mr. Woodward filed a Notice of Change of Address.

8 79. On October 3, 2016, EFCA filed a Notice of Deposition of Barbara D. Lockwood.

9 80. On October 6, 2016, APS filed a Motion for Procedural Conference and Interim
10 Protective Order.

11 81. On October 7, 2016, Timothy M. Hogan filed Motions to Associate Counsel *Pro Hac*
12 Vice to associate Chinyere Ashley Osuala and David Bender as counsel for Vote Solar in this matter.

13 82. On October 11, 2016, counsel for Noble Solutions, CNE, and Direct Energy filed a
14 Notice of Change of Address.

15 83. On October 12, 2016, AARP filed an Application to Intervene and a Motion to Associate
16 Counsel *Pro Hac Vice* to associate John B. Coffman as counsel for AARP in this matter.

17 84. On October 12, 2016, EFCA filed its Response to APS's Motion for Procedural
18 Conference and Interim Protective Order.

19 85. On October 13, 2016, Mr. Woodward filed comments.

20 86. On October 14, 2016, Mr. Woodward filed a Response to Chairman Little's October 4,
21 2016 Memorandum and Call for Recusal.

22 87. On October 14, 2016, a Procedural Order was issued granting APS's request for an
23 interim protective order regarding EFCA's October 3, 2016 Notice of Deposition, and setting a
24 procedural conference to be held on October 20, 2016, for the purpose of discussing discovery issues,
25 including but not limited to the deposition of APS witness Barbara D. Lockwood.

26 88. On October 17, 2016, APS filed a Consent to Email Service.

27 89. On October 18, 2016, APS filed its Reply in Support of Motion for Procedural
28 Conference and Interim Protective Order.

1 90. On October 18, 2016, Correspondence from Commissioner Doug Little was filed in the
2 docket.

3 91. On October 19, 2016, FEA and Vote Solar each filed a Consent to Email Service.

4 92. On October 19, 2016, AURA filed its Response in Support of the Notice of Deposition.

5 93. On October 20, 2016, a procedural conference was held as scheduled by the Procedural
6 Order issued October 14, 2016. APS, EFCA, TEP, Walmart, Freeport Minerals, AECC, Noble
7 Solutions, CNE, Direct Energy, PORA, the Alliance, RUCO, and Staff appeared through counsel or
8 lay representative. APS, Noble Solutions, CNE, Direct Energy, EFCA, and Staff provided comments
9 and arguments regarding discovery issues, and the matter was taken under advisement.

10 94. On October 21, 2016, a Procedural Order was issued granting intervention to AARP,
11 admitting counsel for AARP *pro hac vice* in this matter, and rescheduling the date of the pre-hearing
12 conference in this matter to March 13, 2017.

13 95. On October 24, 2016, Sedona filed an Application to Intervene and a Consent to Email
14 Service.

15 96. On October 26, 2016, Mr. Woodward filed his Reply to Commissioner Little's October
16 18, 2016 Memorandum, and Call for Recusal.

17 97. On October 27, November 1, November 8, and November 9, 2016, AARP filed
18 Consents to Email Service.

19 98. On November 2, 2016, ASDA filed an Application to Intervene and a Consent to Email
20 Service.

21 99. On November 4, 2016, EFCA filed a Supplemental Statement of Authority.

22 100. On November 4, 2016, APS filed a copy of the presentation from its fourth Rate Case
23 Technical Conference.

24 101. On November 9, 2016, APS filed a Response to EFCA's Supplemental Statement of
25 Authority.

26 102. On November 9, 2016, Sunrun Inc. filed an Application for Leave to Intervene.

27 103. On November 10, 2016, Coolidge filed an Application for Leave to Intervene.

28 104. On November 10, 2016, ConservAmerica filed an Application for Leave to Intervene

1 and Consent to Service by Email.

2 105. On November 10, 2016, Granite Creek jointly filed an Application for Leave to
3 Intervene and a Consent to Email Service.

4 106. On November 15, 2016, Mr. Woodward filed comments.

5 107. On November 15, 2016, Sunrun filed a Consent to Email Service.

6 108. On November 17, 2016, a Procedural Order was issued granting intervention to AARP,
7 Sedona, and ASDA, granting requests for service by email, and setting procedural deadlines regarding
8 the deposition of APS witness Barbara Lockwood.

9 109. On November 18, 2016, Granite Creek filed a Notice of Change of Address.

10 110. On November 18, 2016, APS docketed a letter addressed to the Commissioners to which
11 was attached a copy of materials from the presentation from its third Rate Case Technical Conference.

12 111. On November 21, 2016, APS docketed a copy of the presentation from its rate case Cost
13 of Service Model Technical Session.

14 112. On November 23, a Procedural Order was issued granting intervention to Sunrun,
15 Coolidge, ConservAmerica, and Granite Creek.

16 113. On November 28, 2016, Ms. Ferré filed a Consent to Email Service.

17 114. On November 30, 2016, EFCA filed a Notice of Deposition of Barbara D. Lockwood.
18 The Notice indicated that EFCA and APS settled upon December 15, 2016, at 9:00 a.m. as the date and
19 time of the deposition.

20 115. On December 2, 2016, AARP filed a Request to Add Courtesy Email.

21 116. On December 5, 2016, EFCA filed its Emergency Motion to Compel Production of
22 Barbara Lockwood Calendar in Advance of Lockwood Deposition.

23 117. On December 5, 2016, EFCA filed its Emergency Motion for Expedited Consideration
24 Regarding Emergency Motion to Compel Production of Barbara Lockwood Calendar in Advance of
25 Lockwood Deposition.

26 118. On December 5, 2016, EFCA filed its Personal Consultation Certificate.

27 119. On December 7, 2016, APS filed its Response in Opposition to EFCA's Motion to
28 Compel.

- 1 120. On December 7, 2016, APS filed its Motion to Compel.
- 2 121. On December 7, 2016, Mr. Gayer filed his Direct Testimony.
- 3 122. On December 9, 2016, Coolidge filed a Consent to Email Service.
- 4 123. On December 12, 2016, EFCA filed its Reply in Support of Emergency Motion to
- 5 Compel Production of Barbara Lockwood Calendar in Advance of Lockwood Deposition and its
- 6 Emergency Motion to Compel Production of Report Regarding Rate Impact.
- 7 124. On December 13, 2016, by Procedural Order, EFCA's Motion to Compel Production of
- 8 Barbara Lockwood's Calendar was denied and EFCA was ordered to file, no later than December 16,
- 9 2016, its Response to APS's December 7, 2016 Motion to Compel.
- 10 125. On December 13, 2016, EFCA filed a Notice of Withdrawal of its Emergency Motion
- 11 to Compel Production of Report Regarding Rate Impact.
- 12 126. On December 14, 2016, Sunrun filed a Notice of Withdrawal as Intervenor.
- 13 127. On December 14, 2016, Patricia Lee Refo of Snell & Wilmer LLP filed a Notice of
- 14 Appearance on behalf of APS.
- 15 128. On December 16, 2016, AriSEIA filed a Notice of Consent to Email Service.
- 16 129. On December 19, 2016, EFCA filed its Response to the Motion to Compel filed by APS.
- 17 130. On December 19, 2016, Staff filed a Request for Extension of Filing Deadline.
- 18 131. On December 20, 2016, the IBEW Locals filed the Direct Testimony of G. David
- 19 Vandever.
- 20 132. On December 21, 2016, the FEA filed the Direct Testimony of its witnesses Brian C.
- 21 Andrews and Michael P. Gorman.
- 22 133. On December 21, 2016, Mr. Woodward filed his Direct Testimony.
- 23 134. On December 21, 2016, a Procedural Order was issued extending the deadline for the
- 24 filing of Intervenor Direct Testimony to December 28, 2016, approving the request of Sunrun, Inc. to
- 25 withdraw as an intervenor, and approving SEIA's consent to email service request.
- 26 135. On December 22, 2016, ConservAmerica filed the Direct Testimony of its witness Paul
- 27 Walker.
- 28 136. On December 22, 2016, RUCO filed the Direct Testimony of its witnesses John Cassidy

1 and Frank Radigan.

2 137. On December 27, 2016, Mr. Woodward filed his Motion to Compel.

3 138. On December 27, 2016, APS filed its Reply to EFCA's Response to APS's Motion to
4 Compel.

5 139. On December 27, 2016, CNE and Direct Energy each filed a Consent to Email Service.

6 140. On December 28, 2016, AIC filed the Direct Testimony of its witness Branko Terzik.

7 141. On December 28, 2016, ED8/McMullen filed the Direct Testimony of their witness
8 James D. Downing.

9 142. On December 28, 2016, AECC filed the Direct Testimony of its witness Kevin Higgins.

10 143. On December 28, 2016, Walmart filed the Direct Testimony of its witness Gregory W.
11 Tillman.

12 144. On December 28, 2016, SWEEP filed the Direct Testimony of its witness Jeff Schlegel.

13 145. On December 28, 2016, EFCA filed the Direct Testimony of its witness Mark E. Garrett.

14 146. On December 28, 2016, Staff filed the Direct Testimony of its witnesses Ralph Smith,
15 David Parcell, Michael Lewis, and Candrea Allen.

16 147. On December 29, 2016, APS filed its Notice of Intent of Revenue Requirement
17 Settlement Discussions.

18 148. On December 30, 2016, APS filed its Notice of Filing Supplemental Testimony, to
19 which was attached the Supplemental Direct Testimony of Jeffrey M. Burke, setting forth APS's
20 proposed valuation of DG exports using the RCP Methodology.

21 149. On December 30, 2016, EFCA filed its Sur-Response to APS's Motion to Compel;
22 Motion to Strike Reply Brief; and Notice of Lodging Sur-Response.

23 150. On December 30, 2016, EFCA filed its Notice of Deposition of Charles A. Miessner.

24 151. On December 30, 2016, EFCA filed its Notice of Deposition of Leland R. Snook.

25 152. On December 30, 2016, APS filed its Response to Mr. Woodward's Motion to Compel.

26 153. On January 3, 2017, Mr. Woodward filed his Reply to APS's Response to his Motion
27 to Compel.

28 154. On January 4, 2017, APS filed its Response to EFCA's Motion to Strike Reply Brief

1 and Notice of Lodging Sur-Response.

2 155. On January 5, 2017, APS filed a Motion for Protective Order.

3 156. On January 6, 2017, EFCA filed its Response to APS's Motion for Protective Order.

4 157. On January 6, 2017, EFCA filed its Emergency Motion for Expedited Consideration
5 Regarding EFCA's Response to APS's Motion for Protective Order.

6 158. On January 6, 2017, EFCA filed its Amended Notice of Deposition of Leland R. Snook.

7 159. On January 6, 2017, Staff filed its Notice of Time and Location for Settlement
8 Discussions.

9 160. On January 9, 2017, Vote Solar filed its Expedited Motion to Strike and for Procedural
10 Order.

11 161. On January 9, 2017, a Procedural Order was issued setting a procedural conference for
12 the dual purpose of addressing the issue of incorporating the RCP Methodology into this proceeding,
13 as directed by Decision No. 75859; and for hearing oral argument on APS's Motion for Protective
14 Order and responsive pleadings.

15 162. On January 10, 2017, Mr. Gayer docketed a supplement to his Direct Testimony.

16 163. On January 11, 2017, the procedural conference convened as scheduled. Appearances
17 were entered by counsel for APS, AIC, ASDA, Vote Solar, SEIA, EFCA, IO, the Alliance, the FEA,
18 ED8/McMullen, PORA, RUCO, and Staff.

19 164. On January 13, 2017, a Procedural Order was issued rescheduling the hearing date in
20 this matter, along with associated procedural deadlines, in order to facilitate the incorporation of the
21 RCP Methodology into this proceeding pursuant to Decision No. 75859; extending the timeclock by
22 33 days accordingly; denying Vote Solar's Motion to Strike; and Granting APS's Motion for Protective
23 Order in regard to EFCA's Notices of Deposition of APS witnesses Leland R. Snook and Charles A.
24 Miessner.

25 165. On January 13, 2017, EFCA filed its Amended Notice of Deposition of Charles A.
26 Miessner.

27 166. On January 13, 2017, EFCA filed its second Amended Notice of Deposition of Leland
28 R. Snook.

1 167. On January 18, 2017, PORA filed a request to allow Mr. Robert Miller, PORA Director
2 and Chair of Utilities Liaison Committee, to appear and represent PORA as an alternative designee to
3 act “with or in the stead or absence of” PORA’s representatives Albert Gervenack and Rob Robbins in
4 this proceeding.

5 168. On January 18, 2017, a Procedural Order was issued clarifying that public comment
6 would be taken commencing at 10:00 a.m. on March 22, 2017, which was the publicly noticed first day
7 of hearing in this matter; that the evidentiary portion of this proceeding would commence at 10:00 a.m.
8 on April 24, 2017; and that parties wishing to participate in the hearing were required to attend the
9 April 20, 2017 pre-hearing conference.

10 169. On January 18, 2017, EFCA filed its Motion for Reconsideration of the Approval of
11 APS’s Motion for Protective Order.

12 170. On January 19, 2017, Mr. Woodward filed his Motion to Compel APS to Fully Answer
13 Woodward’s Data Request 2.19.

14 171. On January 19, 2017, EFCA filed a Motion to Associate Counsel Pro Hac Vice.

15 172. On January 19, 2017, Commissioner Burns filed Correspondence.

16 173. On January 20, 2017, APS filed its Response to Mr. Woodward’s Second Motion to
17 Compel.

18 174. On January 25, 2017, Mr. Woodward filed a Reply to APS’s January 20, 2017
19 Response.

20 175. On January 27, 2017, Coolidge filed the Direct Testimony of its witness Rick Miller.

21 176. On January 27, 2017, Kroger filed the Direct Testimony of its witness Stephen J. Baron
22 on Cost of Service and Rate Design issues.

23 177. On January 30, 2017, Calpine filed notice of its name change.

24 178. On January 31, 2017, Freeport and AECC filed a request to remove C. Webb Crockett
25 from the service list in this matter.

26 179. On February 3, 2017, PORA filed the Direct Testimony of its witness Al Gervenack.

27 180. On February 3, 2017, the FEA filed the Direct Testimony of its witness Amanda M.
28 Alderson.

1 181. On February 3, 2017, Walmart filed the Direct Testimony of its witnesses Gregory W.
2 Tillman and Chris Hendrix.

3 182. On February 3, 2017, AIC filed the Direct Testimony of its witnesses Gary Yaquinto,
4 Branko Terzik and Daniel G. Hansen.

5 183. On February 3, 2017, RUCO filed the Direct Testimony of its witnesses Frank Radigan
6 and Lon Huber.

7 184. On February 3, 2017, Vote Solar filed the Direct Testimony of its witness Briana Kobor.

8 185. On February 3, 2017, ACAA filed the Direct Testimony of its witness Cynthia Zwick.

9 186. On February 3, 2017, SWEEP filed the Direct Testimony of its witness Jeff Schlegel.

10 187. On February 3, 2017, SEIA filed the Direct Testimony of its witness R. Thomas Beach.

11 188. On February 3, 2017, EFCA filed the Direct Testimony of its witnesses James A.
12 Heidell and Mark E. Garrett.

13 189. On February 3, 2017, Freeport, AECC, Calpine, CNE, and Direct Energy filed the
14 Direct Testimony of their witness Kevin C. Higgins.

15 190. On February 3, 2017, AURA filed the Direct Testimony of its witnesses Patrick J. Quinn
16 and Scott Rubin.

17 191. On February 3, 2017, ConservAmerica filed the Direct Testimony of its witness Paul
18 Walker.

19 192. On February 3, 2017, Staff filed the Direct Testimony of its witnesses Ralph C. Smith
20 and Matt Connolly.

21 193. On February 6, 2017, a Procedural Order was issued granting Mr. Woodward's First
22 Motion to Compel, granting PORA's Request for authorization of Robert Miller to represent PORA as
23 an additional lay representative in this matter, and admitting Curt Ledford to appear *pro hac vice* in
24 this matter.

25 194. On February 6, 2017, the IBEW Locals filed the Direct Testimony of their witness G.
26 David Vandever (Rate Design).

27 195. On February 7, 2017, Walmart filed a Notice of Errata in filing the Direct Testimony of
28 Gregory W. Tillman and Chris Hendrix (Rate Design).

1 196. On February 7, 2017, the IBEW Locals filed a Motion for Extension of Time and the
2 Direct Testimony of David Vandever.

3 197. On February 7, 2017, Commissioner Burns filed Correspondence.

4 198. On February 9, 2017, Mr. Woodward filed a Motion for Clarification.

5 199. On February 9, 2017, APS filed a Notice of Non-Objection to the IBEW Locals' Motion
6 for Extension of Time.

7 200. On February 9, 2017, APS filed a Response to Mr. Woodward's Motion for
8 Clarification.

9 201. On February 16, 2017, Karen White, counsel for the FEA, filed a Motion to Associate
10 Counsel Pro Hac Vice.

11 202. On February 21, 2017, Commissioner Tobin filed Correspondence.

12 203. On February 22, 2017, Chairman Forese filed Correspondence.

13 204. On February 22, Commissioner Burns filed Correspondence.

14 205. On February 24, 2017, APS filed a Request for Extension of Time, and requested
15 expedited consideration.

16 206. On February 24, 2017, a Procedural Order was issued granting the Request for
17 Extension of Time.

18 207. On February 24, 2017, Granite Creek filed its Notice of Direct Filing for a Ruling on
19 Unattended Matters in the Matter of Fuel and Purchased Power Procurement.

20 208. On February 27, 2017, Chairman Forese filed Correspondence.

21 209. On February 28, 2017, Mr. Woodward filed his Motion to Compel Compliance with
22 February 6, 2017 Procedural Order.

23 210. On March 1, 2017, Staff filed its Notice of Filing Settlement Term Sheet. Exhibit B to
24 the Settlement Term Sheet indicated the following parties' support of the Settlement Agreement
25 outlined in the March 1, 2017 Settlement Term Sheet: APS, AIC, the IBEW Locals, ConservAmerica,
26 ASDA, Vote Solar, EFCA, SEIA, AriSEIA, AURA, Direct Energy, Freeport, AECC, Calpine, CNE,
27 the Alliance, Walmart, Kroger, Granite Creek, FEA, Coolidge, ASBA, AASBO, WRA, SCHOA,
28 PORA, ACAA, RUCO, and Staff.

1 211. On March 2, 2017, Staff filed its Request for Modification of Procedural Schedule.

2 212. On March 2, 2017, Mr. Woodward filed his Motion for Reconsideration of February 6,
3 2017 Procedural Order.

4 213. On March 3, 2017, APS filed its Response to Mr. Woodward's Third Motion to Compel.

5 214. On March 3, 2016, a Procedural Order was issued Modifying Filing Deadlines.

6 215. On March 6, 2017, Mr. Woodward filed his Reply to APS's Response.

7 216. On March 7, 2017, a Procedural Order was issued regarding Public Comment in
8 Douglas Arizona.

9 217. On March 10, 2017, a Procedural Order was issued denying Mr. Woodward's Motion
10 to Compel Compliance with February 6, 2017 Procedural Order filed on February 28, 2017.

11 218. On March 10, 2017, APS and Pinnacle West filed a Renewed Motion to Quash.

12 219. On March 14, 2017, Commissioner Burns filed a Response and Objection to Motion to
13 Quash, or, in the Alternative, to Decline to Hear.

14 220. On March 15, 2017, a Procedural Order was issued regarding Public Comment in Yuma,
15 Arizona.

16 221. On March 21, 2017, APS filed a Certification of Publication.

17 222. On March 21, 2017, Staff filed Direct Testimony of its witness Dennis J. Shumaker.

18 223. On March 24, 2017, a Procedural Order was issued regarding Public Comment in
19 Clarkdale, Arizona.

20 224. On March 24, 2017, a Procedural Order was issued changing the deadline for
21 Publication of the Clarkdale, Arizona Public Comment Session.

22 225. On March 24, 2017, Commissioner Forese filed Correspondence.

23 226. On March 24, 2017, Staff filed a Request for an Extension of Time to docket the
24 Settlement Agreement.

25 227. On March 27, 2017, Commissioner Little filed Correspondence.

26 228. On March 27, 2017, Commissioner Tobin filed Correspondence.

27 229. On March 27, 2017, a Settlement Agreement was filed, signed by APS, AIC, the IBEW
28 Locals, ConservAmerica, ASDA, Vote Solar, EFCA, SEIA, AriSEIA, AURA, Direct Energy, Freeport,

1 AECC, Calpine, CNE, the Alliance, Walmart, Kroger, Granite Creek, FEA, Coolidge, ASBA, AASBO,
2 WRA, SCHOA, PORA, ACAA, RUCO, and Staff.

3 230. On March 28, 2017, a Procedural Order was issued regarding Public Comment in
4 Flagstaff, Arizona.

5 231. On March 29, 2017, Commissioner Burns filed Correspondence.

6 232. On March 29, 2017, a Procedural Order was issued changing the venue of the Flagstaff
7 Public Comment Session.

8 233. On March 30, 2017, APS filed a Certification of Publication.

9 234. On March 30, 2017, the IBEW Locals filed Direct Testimony of G. David Vandever in
10 Support of Settlement Agreement.

11 235. On March 31, 2017, Staff docketed a Notice of Filing stating that the remaining
12 appendices to the Settlement Agreement would be filed on April 3, 2017.

13 236. On March 31, 2017, AURA filed the Direct Testimony of its witness Patrick J. Quinn
14 on the Settlement Agreement.

15 237. On April 3, 2017, Mr. Gayer filed his Direct Testimony in Opposition to the Settlement
16 Agreement.

17 238. On April 3, 2017, AIC filed the Direct Testimony of its witness Gary Yaquinto in
18 Support of Settlement Agreement.

19 239. On April 3, 2017, FEA filed the Direct Testimony of its witness Amanda M. Alderson
20 in Support of the Settlement Agreement.

21 240. On April 3, 2017, Patricia Ferré filed her Direct Testimony in Opposition to the
22 Settlement Agreement.

23 241. On April 3, 2017, Mr. Woodward filed his Direct Testimony in Opposition to the
24 Settlement Agreement.

25 242. On April 3, 2017, Mr. Woodward filed the Direct Testimony of his witness Erik S.
26 Anderson, P.E. in Opposition to the Settlement Agreement.

27 243. On April 3, 2017, Mr. Woodward filed the Direct Testimony of his witness Dr. Sam
28 Milham, MD, MPH in Opposition to the Settlement Agreement.

1 244. On April 3, 2017, RUCO filed the Direct Testimony of its witness David P. Tenney in
2 Support of the Settlement Agreement.

3 245. On April 3, 2017, ASDA filed the Direct Testimony of its witness Sean Seitz in Support
4 of the Settlement Agreement.

5 246. On April 3, 2017, Staff filed the Direct Testimony of its witnesses Ralph C. Smith and
6 Elijah O Abinah in Support of the Settlement Agreement.

7 247. On April 3, 2017, SWEEP filed the Direct Testimony of its witness Jeff Schlegel in
8 Opposition to the Settlement Agreement.

9 248. On April 3, 2017, ConservAmerica filed the Direct Testimony of its witness Paul
10 Walker in Support of the Settlement Agreement.

11 249. On April 3, 2017, EFCA filed the Direct Testimony of its witness James A. Heidell in
12 Support of the Settlement Agreement.

13 250. On April 3, 2017, EFCA filed the Direct Testimony of its witness Mark E. Garrett on
14 Commercial and Industrial Customer Rate Design.

15 251. On April 3, 2017, AARP filed the Direct Testimony of its witness John B. Coffman in
16 Opposition to the Settlement Agreement.

17 252. On April 3, 2017, SEIA filed the Direct Testimony of its witness Sara Birmingham and
18 R. Thomas Beach in Support of the Settlement Agreement.

19 253. On April 3, 2017, ACAA filed the Direct Testimony of its witness Cynthia Zwick in
20 Support of the Settlement Agreement.

21 254. April 3, 2017, APS filed the Direct Testimony of its witnesses Barbara Lockwood,
22 Leland Snook and Charles Miessner in Support of the Settlement Agreement.

23 255. On April 3, 2017, ED8/McMullen filed the Direct Testimony of their witness James D.
24 Downing in Opposition to Settlement Agreement.

25 256. On April 3, 2017, Freeport, AECC, Calpine, NewEnergy and Direct filed the Direct
26 Testimony of their witness Kevin C. Higgins in Support of the Settlement Agreement.

27 257. On April 3, 2017, Vote Solar filed the Direct Testimony of its witness Briana Kobor in
28 Support of the Settlement Agreement.

1 258. On April 3, 2017, Walmart filed the Direct Testimony of its witness Chris Hendrix in
2 Support of Settlement Agreement.

3 259. On April 3, 2017, Staff filed a Notice of Filing Remaining Appendices to the Settlement
4 Agreement.

5 260. On April 5, 2017, APS filed a Certification of Publication.

6 261. On April 6, 2017, a Stipulated Motion was jointly filed in this docket by Staff, RUCO,
7 APS, and the “Solar Parties” (ASDA, AriSEIA, SEIA, Vote Solar, and EFCA), (“Moving Parties”)
8 stipulating to the entry of a Protective Order in this docket to govern the treatment of the Joint Solar
9 Cooperation Agreement (“JSCA”)¹¹⁸ as requested by APS, the Solar Parties, and other entities who are
10 not intervenors in this docket. The Moving Parties requested that a Protective Order to Govern the
11 Treatment of the Joint Solar Cooperation Agreement (“JSCA Protective Order”) be entered in the form
12 attached to the Stipulated Motion as Exhibit A.

13 262. On April 7, 2017, Staff filed a Notice of Errata with a revision to the requested JSCA
14 Protective Order.

15 263. On April 10, 2017, counsel for Calpine, CNE, and Direct Energy filed a Motion to
16 Participate Telephonically in the Prehearing Conference, or in the Alternative, to be Excused from
17 Attendance.

18 264. On April 11, 2017, APS filed a Certification of Publication.

19 265. On April 11, 2017, Commissioner Burns filed Correspondence.

20 266. On April 13, 2017, Vote Solar filed a Motion to Participate Telephonically in Prehearing
21 Conference or, in the Alternative, to be Excused from Attendance.

22 267. On April 14, 2017, a Protective Order was issued.

23 268. On April 17, 2017, Mary R. O’Grady filed a Motion to Associate Counsel *Pro Hac Vice*
24 to associate Matthew E. Price as counsel for APS and Pinnacle West.

25 269. On April 17, 2017, Mr. Woodward, APS, Vote Solar and the IBEW Locals filed
26 Responses to Commissioner Burns’ April 11, 2017 Correspondence Request.

27
28 ¹¹⁸ The JSCA is an agreement between APS, the Solar Parties, and certain other entities who are not intervenors in this case.

1 270. On April 17, 2017, APS filed the Rebuttal Testimony of its witnesses Barbara
2 Lockwood, Leland Snook, Charles Miessner and Scott Bordenkircher on the Settlement Agreement.

3 271. On April 17, 2017, ConservAmerica filed the Rebuttal Testimony of its witness Paul
4 Walker in Support of the Settlement Agreement.

5 272. On April 17, 2017, Staff filed the Rebuttal Testimony of its witness Ralph C. Smith in
6 Support of the Settlement Agreement.

7 273. On April 17, 2017, SWEEP filed the Rebuttal Testimony of its witness Jeff Schlegel in
8 Opposition to the Settlement Agreement.

9 274. On April 17, 2017, Mr. Woodward filed his Rebuttal Testimony in Opposition to the
10 Settlement Agreement.

11 275. On April 17, 2017, APS and Pinnacle West filed a Motion to Associate Counsel *pro hac*
12 *vice*.

13 276. On April 17, 2017, EFCA filed a Motion for One Day Extension of Reply Testimony
14 of Mark E. Garrett.

15 277. On April 18, 2017, ED8/McMullen, SEIA, RUCO and EFCA filed Responses to
16 Commissioner Burns' April 11, 2017 Correspondence.

17 278. On April 18, 2017, a Procedural Order was issued admitting counsel *pro hac vice*.

18 279. On April 18, 2017, EFCA filed the Rebuttal Testimony of its witness Mark E. Garrett.

19 280. On April 19, 2017, Commissioner Burns filed Correspondence.

20 281. On April 19, 2017, Elijah Abinah, Director of the Utilities Division, filed
21 Correspondence.

22 282. On April 19, 2017, APS filed a Jointly-Developed Proposed Witness and Hearing
23 Schedule.

24 283. On April 19, 2017, APS filed the Testimony Summaries of Barbara Lockwood, Leland
25 Snook, Charles Miessner and Scott Bordenkircher.

26 284. On April 20, 2017, the City of Sedona filed a Notice of Filing of Correspondence

27 285. On April 20, 2017, EFCA filed a Notice of Errata.

28 286. On April 21, 2017, Commissioner Burns filed Correspondence.

1 287. On April 21, 2017, Commissioner Burns docketed court filings from the Maricopa
2 County Superior Court.

3 288. On April 21, 2017, Staff filed a Notice of Filing Supplemental Responses.

4 289. On April 24, 2017, Mr. Gayer filed the Summary of his Testimony.

5 290. On April 25, 2017, SWEEP filed the Testimony Summary of Jeff Schlegel.

6 291. On April 26, 2017, APS filed an Objection to Commissioner Burns' Demand for
7 Testimony.

8 292. On April 26, 2017, Commissioner Burns filed his Emergency Motion for Relief (1)
9 Confirming that the Administrative Law Judge will Facilitate Calling and Questioning of Hearing
10 Witnesses; and (2) Approval of His Counsel Participating in Questioning (Expedited Ruling and
11 Suspension and Continuance of Hearing Requested).

12 293. On April 26, 2017, ED8/McMullen filed the Testimony Summary of James D.
13 Downing.

14 294. On April 26, 2017, Staff filed the Testimony Summaries of Ralph C. Smith, Elijah O.
15 Abinah and Dennis J. Schumaker.

16 295. On April 26, 2017, EFCA filed the Testimony Summary for Mark E. Garrett.

17 296. On April 27, 2017, RUCO filed the Testimony Summary of David P. Tenney.

18 297. On April 27, 2017, Mr. Woodward filed the Testimony Summary of Dr. Sam Milham,
19 MD, MPH.

20 298. On April 27, 2017, Mr. Woodward filed the Testimony Summary of Erik S. Anderson,
21 PE.

22 299. On April 27, 2017, Mr. Woodward filed his Testimony Summary.

23 300. On April 27, 2017, Commissioner Burns filed a Motion for Determination of
24 Disqualification and for Stay of Proceedings Pending Full Investigation.

25 301. On May 1, 2017, Mr. Gayer filed a Motion to Suspend Proceedings Regarding the 90-
26 Day Fair Notice Issue.

27 302. On May 4, 2017, APS filed the Declaration of Barbara Lockwood.

28 303. On May 4, 2017, SWEEP filed a Notice of Filing Corrected SWEEP Exhibit 6 and

1 Related Corrections to SWEEP Exhibit 4.

2 304. On May 9, 2017, SWEEP filed its Notice of Filing Late Filed SWEEP Exhibits 8A and
3 8B.

4 305. On May 11, 2017, Mr. Woodward filed Corrections to Hearings Transcript Prepared by
5 Coash & Coash.

6 306. On May 15, 2017, Mr. Gayer filed his Initial Closing Brief.

7 307. On May 17, 2017, APS, AIC, the IBEW Locals, ConservAmerica, ASDA, Vote Solar,
8 EFCA, SEIA, AURA, AECC, Freeport, Calpine, CNE, Direct Energy, Walmart, FEA, ED8/McMullen,
9 the Districts, ACAA, SWEEP, AARP, Mr. Woodward, RUCO, and Staff filed their Initial Closing
10 Briefs.

11 308. On May 26, 2017, a Special Open Meeting Revised Notice was docketed.

12 309. On May 30, 2017, Mr. Gayer filed his Reply Closing Brief.

13 310. On May 30, 2017, Commissioner Dunn filed Correspondence.

14 311. On June 1, 2017, APS, AIC, the IBEW Locals, ConservAmerica, AECC, Freeport,
15 EFCA, Calpine, CNE, Direct Energy, SWEEP, Mr. Woodward, and Staff filed their Reply Closing
16 Briefs.

17 312. On June 1, 2017, RUCO filed notice that it would not be filing a Reply Closing Brief.

18 313. On June 2, 2017, Commissioner Burns filed Correspondence, an Emergency Motion to
19 Compel Compliance with Investigatory Subpoenas (Expedited Ruling and Suspension and
20 Continuance of Rate Case Proceedings Requested) and an Emergency Renewed Motion for Relief
21 Staying These Rate-Making Proceedings (Expedited Ruling Requested).

22 314. On June 5, 2017, Commissioner Burns filed a Notice of Errata Regarding Certificate of
23 Service for Emergency Motion to Compel Compliance with Investigatory Subpoenas (Expedited
24 Ruling and Suspension and Continuance of Rate Case Proceedings Requested).

25 315. On June 15, 2017, APS filed its Opposition to the Emergency Renewed Motion of
26 Commissioner Robert Burns for Relief Staying these Rate-Making Proceedings and its Opposition to
27 Emergency Motion of Commissioner Robert Burns to Compel Compliance with Investigatory
28 Subpoenas.

- 1 316. On June 20, 2017, Commissioner Little filed Correspondence.
- 2 317. On June 20, 2017, Commissioner Dunn filed a Proposed Interlocutory Order (Discovery
3 Motions).
- 4 318. On June 20, 2017, Commissioner Burns filed a Response to Commissioner Dunn's
5 Proposed Interlocutory Order.
- 6 319. On June 20, 2017, Commissioner Dunn filed a Proposed Amendment to the Proposed
7 Interlocutory Order.
- 8 320. On June 20, 2017, Chairman Forese filed a Proposed Amendment to the Proposed
9 Interlocutory Order.
- 10 321. On June 26, 2017, Commissioner Burns filed a letter requesting the docketing of the
11 deposition transcripts of APS witnesses Barbara Lockwood, Charles A. Miessner, and Leland R.
12 Snook.
- 13 322. On June 27, 2017, the Commission issued Decision No. 76161.
- 14 323. On June 28, 2017, Commissioner Burns filed an Application for Rehearing of Decision
15 No. 76161.
- 16 324. On June 29, 2017, FEA filed a Notice of Withdrawal of Attorney-of-Record Capt.
17 Natalie A. Cepak.
- 18 325. On June 30, 2017, APS filed a response to Commissioner Burns' request for deposition
19 transcripts.
- 20 326. On July 14, 2017, Commissioner Tobin filed Correspondence.
- 21 327. On July 21, 2017, EFCA docketed a letter in response to Commissioner Tobin's July
22 14, 2107 Correspondence.
- 23 328. On July 26, 2017, a Recommended Opinion and Order ("ROO") was docketed.
- 24 329. On July 31, 2017, EFCA and APS jointly filed a Response to Commissioner Tobin's
25 July 14, 2017 Correspondence.
- 26 330. On August 1, 2017, Mr. Gayer filed Exceptions to the July 26, 2017 ROO.
- 27 331. On August 2, 2017, the Hearing Division filed a Correction Letter indicating
28 typographical corrections to the ROO.

1 332. On August 3 and August 4, 2017, several parties filed Exceptions to the July 26, 2017
2 ROO.

3 333. On August 4, 2017, Chairman Forese filed Correspondence.

4 334. On August 9, 2017, the Open Meeting Agenda was filed.

5 335. On August 9, 2017, the Hearing Division filed a Proposed Amendment.

6 336. On August 11, 2017, APS and EFCA filed their Joint Notice of Resolution of Open
7 Issues Surrounding E-32L Rate Design and Storage.

8 337. On August 14, 2017, the Legal Division filed Correspondence.

9 338. On August 14, 2017, Chairman Forese filed Correspondence.

10 339. On August 14, 2017, Commissioner Burns filed Correspondence.

11 340. On August 14, 2017, Commissioner Dunn filed Proposed Amendments.

12 341. On August 14, 2017, Commissioner Little filed a Proposed Amendment.

13 342. On August 14, 2017, Commissioner Tobin filed Proposed Amendments.

14 343. On August 14, 2017, Commissioner Burns filed Proposed Amendments.

15 344. On August 15, 2017, APS filed a response to Commissioner Burns' Correspondence.

16 345. On August 18, 2017, the Commission issued Decision No. 76295 in these consolidated
17 dockets, resolving all issues in this docket with the exception of the non-AMI meter issues.

18 346. On August 18, 2017, APS filed Rate and Service Schedules and Plans of Administration
19 in conformance with the requirements of Decision No. 76295.

20 347. On August 21, 2017, APS filed a date correction to the RCP Plan of Administration.

21 **Determinations**

22 348. The Settlement Agreement AMI Opt-Out program as set forth in Section 30 and
23 Schedule M of the Settlement Agreement fairly and reasonably balances the interests of all of APS's
24 ratepayers and the utility, results in just and reasonable rates, and serves the public interest.

25 349. The evidence presented does not support allegations that AMI meters pose a risk to
26 public safety or health beyond those risks inherent to the delivery of electricity to homes and businesses,
27 and those inherent to the use and enjoyment of modern electrical appliances and conveniences in those
28 homes and businesses.

350. APS's AMI meters comply with applicable safety standards.

351. Allegations were made regarding increased fire risks, customer privacy and security risks, and cyber security risks in association with the use of AMI meters. The evidence presented does not support those claims.

352. Section 30 and Schedule M of the Settlement Agreement provide a means for those APS customers who do not wish to receive service with APS's standard AMI meter, for whatever reason, to request a non-AMI meter for a one-time installation fee and a monthly fee, both of which are cost-based.

353. The evidence presented demonstrates that the fees proposed by the Settling Parties for the non-standard service provided under the voluntary AMI Opt-Out program are reasonable and appropriate, and that the requirements for participation proposed by the Settling Parties for the non-standard service provided under the voluntary AMI Opt-Out program are also reasonable and appropriate.

354. The record in this proceeding does not support allegations that the proposed fees or requirements for participation in the optional the AMI Opt-Out program are discriminatory.

CONCLUSIONS OF LAW

1. APS is a public service corporation within the meaning of Article XV, Sections 3 and 14 of the Arizona Constitution, A.R.S. §§ 40-203, -204, -221, -250, -251, and -361, and A.A.C. R14-2-801 et. seq.

2. The Commission has jurisdiction over APS and the subject matter of the applications.

3. Notice of the application and hearing was provided in accordance with the law.

4. The rate and charges produced by the Settlement Agreement are just and reasonable.

5. Adoption of the Settlement Agreement as discussed herein is in the public interest.

ORDER

IT IS THEREFORE ORDERED that the Section 30 and Schedule M of Settlement Agreement attached hereto as Exhibit A is hereby adopted.

IT IS FURTHER ORDERED that Arizona Public Service Company is hereby directed to file with the Commission on or before September 29, 2017, Rate and Service Schedules for the AMI Opt-

Out program consistent with the findings herein.

IT IS FURTHER ORDERED that the Rate and Service Schedules for the AMI Opt-Out program approved herein shall be effective for all service rendered on and after October 1, 2017.

IT IS FURTHER ORDERED that Arizona Public Service Company shall notify its affected customers of the AMI Opt-Out program approved herein by means of an insert in its next regularly scheduled billing and by posting on its website, in a form acceptable to the Commission's Utilities Division Staff.

IT IS FURTHER ORDERED that this Decision shall become effective immediately.

BY ORDER OF THE ARIZONA CORPORATION COMMISSION.

Th. Forese
CHAIRMAN FORESE

[Signature]
COMMISSIONER DUNN

[Signature]
COMMISSIONER TOBIN

[Signature]
COMMISSIONER LITTLE

DISSENT
COMMISSIONER BURNS



IN WITNESS WHEREOF, I, TED VOGT, Executive Director of the Arizona Corporation Commission, have hereunto set my hand and caused the official seal of the Commission to be affixed at the Capitol, in the City of Phoenix, this 19th day of September 2017.

[Signature]
TED VOGT
EXECUTIVE DIRECTOR

DISSENT *[Signature]*

DISSENT
TJ/rt

SERVICE LIST FOR:

ARIZONA PUBLIC SERVICE COMPANY

DOCKET NO.:

E-01345A-16-0036 AND E-01345A-16-0123

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BOB BURNS
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ARIZONA CORPORATION COMMISSION

September 12, 2017

RE: Dissenting Opinion in APS Rate Case
Dockets No. E-01345A-16-0036, E-01345A-16-0123

Dear Commissioners, Parties and Stakeholders:

Because I was denied an opportunity to ask questions relevant to my considerations of all of the issues in this case and unable to fully explore critical issues of bias and disqualification, I must dissent from this decision.

I reiterate the positions I expressed in my earlier motions in this rate case and in my comments raised at Commission Staff and Regular Open Meetings involving these matters. The analysis I have raised, and the precedent, constitutional and statutory provisions I have cited, all establish that this decision is a violation of my legal rights and obligations to advance the public's interest, and in violation of this Commission's constitutional obligations to the public. It furthermore constitutes arbitrary and capricious action and an abuse of the Commission's authority.

Any vote in this rate case violates the fundamental constitutional obligations our framers put in place to assure that bias and disqualification issues are fully investigated, disclosed and acted on to protect consumers and parties. The citizens who created this Commission and gave it unique powers through our constitution expected we would consider fully and protect the interests of utility consumers, not our own personal interests. By approving this rate request, my colleagues acted outside their legal authority and created an illegal and unenforceable order and approval.

Therefore, I must dissent.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert L. Burns".

Robert L. Burns
Commissioner

DOCKET NOS. E-01345A-16-0036 ET AL.

EXHIBIT A

ARIZONA PUBLIC SERVICE COMPANY

DOCKET NOS. E-01345A-16-0036 and E-01345A-16-0123

SETTLEMENT AGREEMENT

MARCH 27 2017

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**SETTLEMENT AGREEMENT
ARIZONA PUBLIC SERVICE COMPANY'S REQUEST FOR A RATE
INCREASE (DOCKET NO. E-01345-A-0036) AND
THE FUEL AND PURCHASED POWER PROCUREMENT AUDIT OF APS
(DOCKET NO. E-01345A-16-0123)**

The purpose of this Settlement Agreement ("Agreement") is to settle disputed issues related to Arizona Public Service Company's ("APS" or "Company") application to increase its rates (Docket No. E-01345A-16-0036) and the fuel and purchased power procurement audit of APS (Docket No. E-1345A-16-0123). This Agreement is entered into by the following entities:

Arizona Corporation Commission - Utilities Division Staff
Arizona Public Service Company
Residential Utility Consumer Office
Arizona Utility Ratepayer Alliance
Federal Executive Agencies
Arizona Solar Deployment Alliance
Arizona Solar Energy Industries Association
Vote Solar
Solar Energy Industries Association
Arizona School Boards Association and the Arizona Association of School Business Officials
Arizonans for Electric Choice and Competition
Western Resource Advocates
Wal-Mart Stores, Inc. and Sam's West, Inc.
Local Unions 387 and 769 of the International Brotherhood of Electrical Workers, AFL-CIO
Freeport Minerals Corporation
Arizona Community Action Association
The Kroger Co.
Arizona Investment Council
Property Owners & Residents Association, Sun City West
Sun City Home Owners Association
REP America d/b/a ConservAmerica
Constellation New Energy, LLC
Direct Energy Business, LLC
Calpine Energy Solutions, LLC
Arizona Competitive Power Alliance
Energy Freedom Coalition of America
City of Coolidge
Granite Creek Farms, LLC
Granite Creek Power & Gas, LLC

These entities shall be referred to collectively as Signing Parties; a single entity shall be referred to individually as a Signing Party.

I. RECITALS

- 1.1 APS filed the rate application underlying ACC Docket No. E-01345A-16-0036 on June 1, 2016. On August 6, 2016, the administrative law judge granted a motion to consolidate the Fuel and Purchased Power Procurement Audits, ACC Docket No. E-01345A-16-0123, with APS's rate case. Collectively, these dockets may be referred to herein as the Docket.

- 1.2 Subsequently, the Commission approved applications to intervene filed by Richard Gayer; Patricia Ferre; Warren Woodward; Arizona Solar Deployment Alliance ("ASDA"); IO Data Centers, LLC ("IO"); Freeport Minerals Corporation (Freeport) and Arizonans for Electric Choice and Competition (collectively, "AECC"); Sun City Home Owners Association ("Sun City HOA"); Western Resource Advocates ("WRA"); Arizona Investment Council ("AIC"); Arizona Utility Ratepayer Alliance ("AURA"); Property Owners and Residents Association, Sun City West ("PORA"); Arizona Solar Energy Industries Association ("AriSEIA"); Arizona School Boards Association ("ASBA") and Arizona Association of School Business Officials ("AASBO") (collectively, "ASBA/AASBO"); Cynthia Zwick, Arizona Community Action Association ("ACAA"); Southwest Energy Efficiency Project ("SWEEP"); the Residential Utility Consumer Office ("RUCO"); Vote Solar; Electrical District Number Eight and McMullen Valley Water Conservation & Drainage District (collectively, "ED8/McMullen"); The Kroger Co. ("Kroger"); Tucson Electric Power Company ("TEP"); Pima County; Solar Energy Industries Association ("SEIA"); the Energy Freedom Coalition of America ("EFCA"); Wal-Mart Stores, Inc. and Sam's West, Inc. (collectively, "Wal-Mart"); Local Unions 387 and 769 of the International Brotherhood of Electrical Workers, AFL-CIO (collectively, "the IBEW Locals"); Noble Americas Energy Solutions LLC ("Noble Solutions"); the Arizona Competitive Power Alliance ("the Alliance"); Electrical District Number Six, Pinal County, Arizona ("ED 6"); Electrical District Number Seven of the County of Maricopa, State of Arizona ("ED 7"); Aguila Irrigation District ("AID"); Tonopah Irrigation District ("TID"); Harquahala Valley Power District ("HVPD"); and Maricopa County Municipal Water Conservation District Number One ("MWD") (collectively, Districts); SunRun; the Federal Executive Agencies ("FEA"); Constellation New Energy, Inc. ("CNE"); Direct Energy, Inc. ("Direct Energy"); AARP; the City of Coolidge ("Coolidge"); REP America d/b/a ConservAmerica ("ConservAmerica");

and Granite Creek Power & Gas and Granite Creek Farms LLC (collectively, "Granite Creek"). SunRun subsequently withdrew its intervention.

- 1.3 APS filed a notice of revenue requirement settlement discussions on December 29, 2016. Revenue requirement settlement discussions began on January 12, 2017; rate design settlement discussions began on February 6, 2017. The settlement discussions were open, transparent, and inclusive of all parties to this Docket who desired to participate. All parties to this Docket were notified of the settlement discussion process, were encouraged to participate in the negotiations, and were provided with an equal opportunity to participate.
- 1.4 The terms of this Agreement are just, reasonable, fair, and in the public interest in that they, among other things, establish just and reasonable rates for APS customers; promote the reliability of the electric system, as well as the convenience, comfort and safety, and the preservation of health, of the employees and customers of APS consistent with the Commission's obligations under Arizona law; resolve the issues arising from this Docket; and avoid unnecessary litigation expense and delay.
- 1.5 The Signing Parties believe that this Agreement balances APS's rate increase with benefits for customers. The Signing Parties agree that some of the significant provisions of the Agreement include:
 - a. A \$87.25 million non-fuel, non-depreciation revenue requirement increase, or a reduction of \$58.96 million from APS's original application.
 - b. An average 4.54% bill impact for residential customers compared to an average 7.96% bill impact for residential customers in APS's original application.
 - c. A refund to customers through the Demand Side Management Adjustor Clause ("DSMAC"), of \$15 million in collected, but unspent DSMAC funds to mitigate the first year bill impacts.
 - d. A rate case stay out, in which APS agrees not to file a new general rate case filing prior to June 1, 2019;

- e. A program to expand access to utility owned rooftop solar for low and moderate income Arizonans, Title I Schools, and rural governments;
 - f. Continuation of a buy-through rate for Industrial and large General Service customers;
 - g. Continuation of crisis bill assistance for low income customers;
 - h. More off-peak hours and holidays for time-differentiated rates;
 - i. A moratorium on new self-build generation until January 1, 2022 and through December 31, 2027 for construction of combined-cycle generating units;
 - j. An experimental pilot technology rate initially available for up to 10,000 customers;
 - k. New updated rate designs with rate options for all customers.
 - l. An educational plan and concerted outreach effort by APS on its various rate plans with transitional rates in place until May 1, 2018 to allow for customer education;
 - m. Additional discounts for Schools and Military Customers;
 - n. Resolution of Solar Distributed Generation ("DG") issues for the term of the Settlement Agreement;
 - o. Agreement by Signing Parties to withdraw any appeals of the Commission's Value of Solar Decisions (Docket Nos. 75859 and 75932).
 - p. Agreement by Signing Parties to refrain from pursuing actions in any forum that are inconsistent with the provisions of the Settlement Agreement.
- 1.6 The Signing Parties request that the Commission find that the rates, terms and conditions of this Agreement are just, fair and reasonable and in the public interest in accordance with Article 15, Sections 3 and 14 of the Arizona Constitution and Arizona Revised Statutes Section 40-250 along with any and all other necessary findings, and to approve the Agreement and order that it and the rates contained herein become effective on July 1, 2017.

TERMS AND CONDITIONS

II. RATE CASE STABILITY PROVISION

- 4.2 APS will not file its next general rate case before June 1, 2019. The test year end date for the base rate increase filing contemplated in this section shall be no earlier than December 31, 2018.

III. RATE INCREASE

- 3.1. APS shall receive a \$87.25 million non-fuel, non-depreciation revenue requirement increase. When the reduction for base fuel of \$53.63 million and the increase for depreciation of \$61.00 million is taken into account, the result is a net base rate increase of \$94.624 million, exclusive of the adjustor transfer described below in Paragraph 3.2.
- 3.2 APS also requested to transfer amounts collected in adjustor mechanisms to base rates, which is revenue neutral since the adjustor balances will be reduced with the transfer to base rates. After including the transferred adjustor mechanism amount of \$267.95 million, the Company's total base rate revenue requirement is \$362.58 million ("revenue requirement"). This amount is comprised of: (1) a non-fuel base rate increase of \$148.250 million, which includes a return on and of plant that is in service as of December 31, 2016 ("Post-Test Year Plant"), twelve (12) months beyond the test year ending December 31, 2015 (the "2015 Test Year"); (2) a base fuel rate decrease of \$53.63 million; and (3) the transfer from adjustor mechanisms of \$267.95 million to base rates described in Paragraph VIII herein. When these amounts are netted together, this amounts to a net base rate increase of \$94.624 million.
- 3.3 The Company's jurisdictional fair value rate base used to establish the rates agreed to herein is \$9,990,561,000. APS's total adjusted Test Year revenue is \$2,888,903,000.
- 3.4 In future rate cases, APS will agree to impute net revenue growth for any revenue producing plant included in post-test year plant.

IV. BILL IMPACT

- 4.1 When new rates become effective, customers will have on average a 3.28% bill impact.
- a. Residential customers will have on average a 4.54% bill impact.

- b. General Service customers will have on average a 1.93% bill impact.
- 4.2 To mitigate the first year bill impacts, APS will refund to customers through the DSMAC \$15 million in collected, but unspent DSMAC funds.

V. COST OF CAPITAL

- 5.1 An original cost of capital structure comprised of 44.2% debt and 55.8% common equity shall be adopted for ratemaking purposes for this Docket.
- 5.2 A return on common equity of 10.0% and an embedded cost of debt of 5.13% shall be adopted for ratemaking purposes for this Docket.
- 5.3 The Signing Parties agree to a fair value rate of return of 5.59% for this Docket, which includes a 0.8% return on the fair value increment.
- 5.4 The provisions set forth herein regarding the quantification of fair value rate base, fair value rate of return, and the revenue requirement are made for purposes of settlement only and should not be construed as admissions against interest or waivers of litigation positions related to other or future cases.

VI. DEPRECIATION/AMORTIZATION AND DECOMMISSIONING

- 6.1 APS will lower its proposed annual depreciation expense pro forma on APS's as filed SFR C-2 by \$20 million per year, resulting in a \$61 million increase in depreciation expense (inclusive of the Cholla 2 Regulatory Asset Amortization), by adjusting its proposed lives/net salvage rates for its distribution accounts and by accelerating the amortization of the present excess depreciation reserves for Palo Verde.
- 6.2 The annual depreciation expense for the Palo Verde Nuclear Generating Station will be decreased by \$21 million.
- 6.3 The decrease in Palo Verde depreciation not needed to fund the reduction in revenue requirements described in Section 6.1 above ("Excess Amount") will be offset by a more rapid amortization of the Cholla 2 regulatory asset such that there will be no additional impact on APS's revenue requirement in this case.
- 6.4 Should the Cholla 2 regulatory asset become fully amortized prior to APS's next general rate case, the Excess Amount will be used to accelerate

the recovery of APS's remaining investment in the Navajo Generating Station.

- 6.5 For purposes of settling this rate case, APS's depreciation rates will be deemed to use the straight-line method, vintage group procedure, and remaining life technique.
- 6.6 In APS's next rate case, APS will file a depreciation rate study that includes alternative calculations for cost of removal and dismantlement (negative net salvage) using the "FAS 143" discounted net present value method, computed using a discount rate to be agreed upon.
- 6.7 A copy of APS's agreed upon depreciation rates is attached as Appendix A.
- 6.8 APS's annual nuclear decommissioning expense proposal will be adopted. A copy of the decommissioning contribution schedule is attached as Appendix B.
- 6.9 Subject to the discussion herein of Cholla 2, the Company shall use its proposed amortization rates for regulatory assets and liabilities as well as for other intangibles.

VII. FUEL AND POWER SUPPLY ADJUSTMENT PROVISIONS

- 7.1 The base fuel rate shall be lowered from \$0.032071 per kWh as set in the Decision No. 73183 to \$0.030168 per kWh. This change shall take effect on the effective date of the new rates contained in this Agreement, in accordance with the Plan of Administration for the Power Supply Adjustor ("PSA") to be approved in this case.
- 7.2 APS shall be permitted to include chemical costs for lime, ammonia and sulfur that are incurred in the generation process in the PSA.
- 7.3 APS shall be permitted to include third-party storage expenses in the PSA provided that APS files for approval to include any third-party storage contract with the Commission 90 days before it becomes effective.
- 7.4 The September 30 Preliminary Annual PSA Rate filing and the December 31 Final Annual PSA Rate calculation filing will be consolidated into one annual reset filing that will occur annually on or before November 30. Unless the Commission otherwise acts on the APS calculation by

February 1, the PSA rate proposed by APS will go into effect with the first billing cycle in February.

- 7.5 The PSA Plan of Administration shall be amended as necessary to reflect the terms of this Agreement and shall be approved concurrent with the approval of this Agreement. The revised PSA Plan of Administration is attached as Appendix C.

VIII. TRANSFER OF ITEMS FROM ADJUSTMENT MECHANISMS TO BASE RATES

- 8.1 The Signing Parties agree that certain revenue requirements collected through the Renewable Energy Adjustor Clause ("REAC"), DSMAC Lost Fixed Cost Recovery ("LFCR"), Transmission Cost Adjustor ("TCA"), Environmental Impact Surcharge ("EIS"), Four Corners Rate Rider ("FCRR"), and the System Benefits Charge ("SBC") adjustment mechanisms shall be transferred to base rates and those adjustor rates will be zeroed out or reduced, as proposed by APS herein.
- 8.2 Adjustor transfers agreed to herein shall include the portion of transmission revenue requirements that was collected in the test year for the TCA, the portion of the lost fixed costs that was collected in the test year for the LFCR; the portion of environmental compliance revenue requirements that was collected in the test year for the EIS; an increase in the portion of energy efficiency expense to be collected in base rates from the DSMAC; the revenue requirement of Arizona Sun related renewable generation, the Schools and Governments Program and the Community Power Project will be transferred from the REAC into base rates; the portion of APS's acquisition of Southern California Edison's share of Four Corners currently collected in the Four Corners Rate Rider; and the portion of the System Benefits reduction that went into effect January 1, 2016 to reflect Palo Verde Unit 2 having been fully funded in the nuclear decommissioning trust. The specific amounts in each adjustor to be transferred to base rates pursuant to this Section are identified in Appendix D. The amounts transferred will be calculated using Staff's revenue conversion factor.
- 8.3 On the effective date of the new rates contained in this Agreement, the REAC, DSMAC, LFCR, TCA, EIS, FCRR and SBC rates shall be reduced to reflect the removal of the amounts identified in Appendix D.

IX. RATE TREATMENT RELATED TO THE INSTALLATION OF SELECTIVE CATALYTIC REDUCTIONS AT FOUR CORNERS UNITS 4 AND 5

- 9.1 The parties agree that this Docket shall remain open for the sole purpose of allowing APS to file a request that its rates be adjusted no later than January 1, 2019 to reflect the proposed addition of Selective Catalytic Reduction (“SCR”) equipment at Four Corners, as requested in APS’s application in this Docket.
- 9.2 APS shall be authorized by the Commission to defer for possible later recovery through rates, all non-fuel costs (as defined herein to include all O&M, property taxes, depreciation, and a return at APS’s embedded cost of debt in this proceeding) of owning, operating and maintaining the Selective Catalytic Reduction environmental controls at the Four Corners Power Plant from the date such controls go into service until the inclusion of such costs into rates. Nothing in this paragraph shall be construed in any way to limit this Commission’s authority to review the entirety of the project and to make any disallowances thereof due to imprudence, errors or inappropriate application of the requirements of this Decision. The interest component of the SCR deferral will be set at APS’s embedded cost of debt established in this Agreement.
- 9.3 Any filing seeking a rate adjustment pursuant to Section 9.1 shall include the following schedules: (1) the most current APS balance sheet at the time of filing; (2) the most current APS income statement at the time of filing; (3) an earnings schedule that demonstrates that the operating income resulting from the rate adjustment does not result in a return on rate base in excess of that authorized by this Agreement in the period after the rate adjustment becomes effective; (4) a revenue requirement calculation, including the amortization of any deferred costs; (5) an adjusted rate base schedule; and (6) a typical bill analysis under present and filed rates. The Signing Parties agree to use good faith efforts to process this rate adjustment request such that any resulting rate adjustment becomes effective no later than January 1, 2019, pursuant to Section 9.1.
- 9.4 The Signing Parties shall not present any issues in the rate adjustment proceeding other than those specifically described in this Section.

- 9.5 Section 9 is agreed to without prejudice to any position taken by a Signing Party in any other pending proceeding, including ASBA/AASBO v. ACC, 1 CA-CC-15-0001.

X. COST DEFERRAL RELATED TO THE OCOTILLO MODERNIZATION PROJECT

- 10.1 APS will be authorized to defer for possible later recovery through rates, all non-fuel costs (as defined herein to include all O&M, property taxes, depreciation, and a return at APS's embedded cost of debt in this proceeding) of owning, operating, and maintaining the Ocotillo Modernization Project ("OMP") and retiring the existing steam generation at Ocotillo. Nothing in this paragraph shall be construed in any way to limit the Commission's authority to review the entirety of the project and to make any disallowances thereof due to imprudence, errors or inappropriate application of the requirements of this Decision. The interest component of the Ocotillo deferral will be set at APS's embedded cost of debt established in this Agreement.
- 10.2 The entire OMP will be in service before the rate effective date of APS's next general rate case, and the entire OMP investment will be addressed and resolved in that proceeding.
- 10.3 This agreement does not address the prudence of the OMP, and a deferral of the OMP costs does not guarantee recovery of those costs. Consideration of OMP in APS's next general rate case does not create any precedent, guarantee, or certainty regarding the consideration or treatment of post-test year plant.

XI. COST DEFERRAL RELATED TO CHANGES IN ARIZONA PROPERTY TAX RATE

- 11.1 APS shall be allowed to defer for future recovery (or credit to customers) the Arizona property tax expense above or below the test year caused by changes to the applicable Arizona composite property tax rate.
- 11.2 The property tax deferral will not accrue interest during the deferral period, unless it is negative, in which case, it will accrue interest in favor of APS's customers at APS's short term debt rate.
- 11.3 Beginning with the effective date of the Commission decision resulting from APS's next general rate case, any final property tax rate deferral that

has a positive balance will be recovered from customers over 10 years, with a return at APS's short term debt rate, also with a return on any unrefunded negative balance at the same short term debt rate.

- 11.4 The Signing Parties reserve the right to review APS's property tax deferrals in APS's next general rate case for reasonableness and prudence.
- 11.5 Prior to the next APS general rate case, APS will meet and confer with Staff, RUCO and other stakeholders regarding the appropriate ratemaking treatment for the two year lag on payment of property taxes for post-test year plant.

XII. COST OF SERVICE STUDY

- 12.1 APS agrees in its next rate case to make available to parties its cost of service study in an Excel spreadsheet with inputs linked to outputs so that parties can change the inputs as necessary to reflect their position in the case. APS will meet and confer with stakeholders prior to filing to discuss the cost of service format.
- 12.2 In its next general rate case, APS agrees to perform the Average and Excess methodology to allocate production demand costs to residential and general service classes and then reallocate production demand within the residential sub-classes based on 4CP. This does not preclude APS or other stakeholders from proposing alternative allocation methods.

XIII. NAVAJO GENERATING STATION

- 13.1 APS will address any potential impacts of the closure of the Navajo Generating Station prior to the filing of APS's next rate case in Docket No. E-00000C-17-0039. To the extent it deems appropriate, APS may request that a separate Docket specific to APS be opened to address any issues pertaining to APS's interest in the Navajo Generating Station.

XIV. ANNUAL WORKFORCE PLANNING REPORT

- 14.1 APS shall file a workforce planning report with the Commission containing the following information: (i) the identification of each of the specific challenges or issues APS faces regarding workforce planning; (ii) the specific action(s) APS is taking to address each challenge or issue; and (iii) an update of the progress APS has made toward resolving each challenge or issue. The workforce planning report shall be filed on an annual basis, in this Docket, on or before May 31st, until the conclusion

of the next APS general rate case, and shall be limited to the following job classifications: Electrician-Journeyman, Lineman-Journeyman, Technician-E&I, and Operator-Power Plant (a/k/a Auxiliary Operators and Control Operators). At a minimum, the workforce planning report shall set forth: (i) the number of employees then currently holding these positions; (ii) the present mean and median ages of APS's workforce with respect to these job classifications; (iii) the share of retirement-eligible employees, both as a percentage and in absolute terms, in each of these job classifications; and (iv) the anticipated hiring level and attrition level for each of these job classifications.

- 14.2 The obligation contained in this Section XIV for APS to file a workforce planning report supersedes any prior workforce planning reporting requirement including the requirement in Decision No. 73183.

XV. SELF-BUILD MORATORIUM

- 15.1 APS will not pursue any new self-build generation option having an in-service date prior to January 1, 2022 unless expressly authorized by the Commission. Such restriction shall extend to December 31, 2027 with regard to the construction of combined-cycle generating units.
- 15.2 This self-build moratorium does not include any of the following: (1) the OMP; (2) the acquisition of a generating unit or an interest in a generating unit from a non-affiliated merchant or utility generator; (3) the acquisition of generation needed for system reliability when under the circumstances the seeking of prior Commission approval is impossible or impractical; (4) distributed generation or storage of less than 50 MW per location; (5) microgrids irrespective of size; (6) renewable generation; or (7) uprates or repowering of existing APS-owned generation.
- 15.3 As part of any APS request for Commission authorization to self-build generation, APS will address:
- a. The Company's specific unmet needs for additional long-term resources.
 - b. The Company's efforts to secure adequate and reasonably-priced long-term resources from the competitive wholesale market to meet these needs.

- c. The reasons why APS believes those efforts have been unsuccessful, either in whole or in part.
 - d. The extent to which the request to self-build generation is consistent with any applicable Company resource plans and competitive resource acquisition rules.
 - e. The anticipated cost of the proposed self-build option in comparison with suitable alternatives available from the competitive market for the relevant analysis period.
- 15.4 Nothing in this section shall be construed as relieving APS of its obligation to prudently acquire generating resources, including, but not limited to, seeking the above authorization to self-build a generating resource or resources.
- 15.5 The issuance of any RFP or the conduct of any other competitive solicitation in the future shall not, in and of itself, preclude APS from negotiating bilateral agreements with non-affiliated parties.

XVI. TAX EXPENSE ADJUSTOR MECHANISM

- 16.1 In the event that significant Federal income tax reform legislation is enacted and becomes effective prior to the conclusion of APS's next general rate case, and such legislation materially impacts the Company's annual revenue requirements, APS will create a rate adjustment mechanism to enable the pass-through of income tax effects to customers.
- 16.2 This adjustor mechanism has the following elements:
- a. The change in revenue requirements due to Federal tax reform will be measured as the change in:
 - i. The Federal Income Tax Rate (currently 35%) applied to the Company's Adjusted 2015 Test Year;
 - ii. The annual amortization of any resulting excess deferred income tax regulatory account compared to the Company's Adjusted 2015 Test Year, and;

- iii. Permanent income tax adjustments (such as interest expense and/or property tax expense deductibility) compared to those taken in the Company's Adjusted 2015 Test Year.
- b. The Company will change retail rates through the Tax Expense Adjustor Mechanism (TEAM).
 - i. The rate will be computed on a prospective basis each year based on the jurisdictional retail income tax change as compared to the income tax expense used to set rates in this proceeding combined with the Company's projection of jurisdictional retail sales for the coming year. The rate will be filed on December 1st and will become effective with the first billing cycle in March of each year.
 - ii. The adjustment will be assessed to each customer as an equal per kWh charge.
 - iii. The adjustor mechanism will include a balancing account such that any under- or over-collected balance will be recovered or refunded in the following year.
 - iv. Each year's under- or over-collected balance will accrue interest at the Company's applicable cost of short-term debt.
- 16.3 The TEAM will terminate with the effective date of APS's next general rate case.
- 16.4 The Plan of Administration for the TEAM is attached as Appendix E.

XVII. RESIDENTIAL RATE DESIGN

- 17.1 R-XS: Rate Schedule "R-XS" is available to customers without distributed generation using 600 or less kWh per month on average. The Basic Service Charge for R-XS is \$10 for the average billing month, calculated at a daily rate of \$0.329.
- 17.2 R-Basic: Rate Schedule "R-Basic" is available to customers without distributed generation using more than 600 kWh but less than 1,000 kWh per month on average. The Basic Service Charge for R-Basic is \$15.00 for the average billing month, calculated at a daily rate of \$0.493.

- 17.3 R-Basic Large: Rate Schedule “R-Basic Large” is available to customers without distributed generation using 1,000 kWh per month or more on average. The Basic Service Charge for R-Basic Large is \$20.00 for the average billing month, calculated at a daily rate of \$0.658.
- 17.4 TOU-E: Rate Schedule “TOU-E” is available to all customers. The Basic Service Charge for “TOU-E” is \$13 for the average billing month, calculated at a daily rate of \$0.427. Winter Super Off-peak hours are from 10:00am - 3:00pm. Customers currently on a Time Advantage rate plan will transition to this rate unless they select to voluntarily move to another rate for which they are eligible. For DG customers, the average off-set rate shall be inclusive of the Grid Access Charge described in Section 18.1.
- 17.5 R-2: Rate Schedule “R-2” is a three-part rate available to all customers. The Basic Service Charge for R-2 is \$13 for the average billing month; calculated at a daily rate of \$0.427.
- 17.6 R-3: Rate Schedule R-3 is a three-part rate available to all customers. The Basic Service Charge for R-3 is \$13 for the average billing month; calculated at a daily rate of \$0.427. Customers currently on the Combined Advantage rate plan will transition to this rate unless they select to voluntarily move to another rate for which they are eligible.
- 17.7 R-Tech: An Optional R-Tech Pilot Rate Program shall be created that will initially serve up to 10,000 customers. It is a three-part rate that is available to residential customers when the following criteria are met: (1) two or more qualifying primary on-site technologies were purchased within 90 days of the customer enrolling in the rate; or (2) one qualifying primary on-site technology was purchased within 90 days of the customer enrolling in the rate and two or more qualifying secondary on-site technologies. Qualifying technologies are set forth in Rate Schedule R-Tech attached hereto as Appendix F. The Basic Service Charge for R-Tech is \$15 for the average billing month, calculated at a daily rate of \$0.493.
 - a. Once 6,000 customers have signed up to take service under this program, and if such threshold has been reached prior to the Company's next general rate case filing, the Company shall provide notice and promptly convene a meeting of the interested parties to this Docket to discuss the future of the Pilot Program. If

each of the parties to that discussion agree on a new customer participation level for the R-Tech Pilot Program that shall apply until the Commission determines the disposition of the R-Tech Pilot Program during the Company's next general rate case the Company shall file a notice in this Docket to that effect and the program shall continue to be offered up to the new agreed upon customer participation level.

- b. However, if all parties cannot agree to a new customer participation level, then APS shall file a report on the R-Tech Pilot Program and request that the Commission determine whether to continue, expand, or terminate the program in the Docket within 90 days of the date that 7,000 customers have begun taking service under this program. The Commission will then promptly review the program and determine if it should continue, terminate, or be adjusted.
- c. The Signatories have agreed to a rate design for the R-Tech Pilot Rate Program as set forth in Appendix F.

17.8 The on-peak period will be 3:00 pm – 8:00 pm weekdays for TOU-E, R-2, R-3, and R-Tech, excluding holidays specified in Appendix F.

17.9 Attached as Appendix G is the Residential and Commercial rate summary.

XVIII. RESIDENTIAL RATE DESIGN FOR DISTRIBUTED GENERATION CUSTOMERS

18.1 DG customers are eligible for four different rate schedules including all proposed TOU and Demand rates. DG customers that select TOU-E will be subject to a Grid Access Charge as reflected in Appendix F.

18.2 The self-consumption offset rate for TOU-E will be \$0.105/kWh, which is inclusive of the Grid Access Charge, but exclusive of taxes and adjustors. This is an approximately \$0.120/kWh offset rate after these adjustments. The offset rate is based on the load profile and production profile of APS customers with DG during the test year. Individual customer offset will vary based on individual usage patterns and DG system size, orientation, and production.

18.3 The Resource Comparison Proxy Rate ("RCP") for exported energy established in Decision No. 75859, as amended by Decision No. 75932, will be \$0.129/kWh in year one, which is inclusive of undifferentiated

transmission, distribution, and loss components. This export rate was calculated using a 2015 base year with an adjustment to achieve the final export rate. Attached as Appendix H is the RCP Rate Rider, POA and EPR-6 Legacy Rate Rider.

- 18.4 This first year export rate is the product of settlement negotiations and does not create any precedent, imply any change to the structure of or detail in the Resource Comparison Proxy, or otherwise change any aspect of Decision No. 75859.
- 18.5 DG customers that file a completed interconnection application before the rate effective date adopted in the Decision in this case shall be grandfathered consistent with Section 18.6 for a period of twenty years, with the twenty year period beginning from the date the system is interconnected with APS.
- 18.6 As contemplated in Decision No. 75859, grandfathered DG customers will continue to take service under full retail rate net metering and will continue to take service on their current tariff schedule for the length of the grandfathering period, which for APS are rate schedules E-12, ET-1, ET-2, ECT-1, or ECT-2. In its next rate case, APS will propose that the rates on each of these legacy tariffs will be updated with an equal percent increase applied to every rate component equal to the residential average base rate increase approved. In addition, grandfathered DG customers currently served on E-3 or E-4 will continue on the current E-3 or E-4 Rate Riders for as long as they meet the eligibility criteria and/or discontinue participation in the program.

XIX. RESIDENTIAL RATE AVAILABILITY

- 19.1 All customers may select R-Basic, R-Basic Large, TOU-E, R-2, R-3, R-Tech or R-XS if they qualify until May 1, 2018, except to the extent grandfathered under other sections of this Settlement Agreement. Distributed Generation customers will not be eligible for R-XS, R-Basic or R-Basic Large. After May 1, 2018, R-Basic Large will no longer be available to new customers or customers who are on another rate. New customers after May 1, 2018 may choose TOU-E, R-2, R-3 or if they qualify, R-XS or R-Tech. After 90 days, new customers may opt-out of their current rate and select R-Basic if they qualify. Customers transitioning to R-Basic must stay on that rate for at least 12 months.

XX. COMMERCIAL AND INDUSTRIAL RATE DESIGN

- 20.1 APS's General Service XS non-demand rate is adopted and attached as Appendix G.
- 20.2 APS's Aggregation feature and Extra High Load Factor Rate are as proposed by the Company. Copies of these Schedules are attached as Appendix I.
- 20.3 Economic Development Service Schedule 9 is approved as modified by Staff and is attached as Appendix J.
- 20.4 There will be no change to the current net metering structure for non-residential solar customers until addressed in a future Value of Solar or other proceeding.
- 20.5 The Signing Parties agree that issues related to the non-ratchet rate design alternative for C&I remain unresolved by this Agreement, and the Signing Parties agree they may present their respective positions in the hearing scheduled in this proceeding.
- 20.6 The on-peak period will be 3:00 pm – 8:00 pm weekdays for XS through E32-L, but will remain unchanged for E-35.

XXI. E-32L RATE DESIGN

- 21.1 APS agrees to redesign E-32 L in a revenue neutral manner to recover an additional amount of \$1.36 per kW in the unbundled generation charges.

XXII. SCHOOLS DISCOUNT RATE RIDER

- 22.1 All public schools and public school districts will be eligible for a new rate rider. If they apply for service under this rate rider they receive a discount of \$0.0024/kWh.

XXIII. AG-X

- 23.1 The capacity reserve charge applicable to AG-X customers will be equal to \$5.5398 per kW-month (60% of current FERC demand charge of \$9.233 per kW), applied to 100% of the customer's billing demand.

- 23.2 This charge and other parameters will be re-evaluated in APS's next rate case, including whether AG-X should be evaluated as a separate customer class in the cost of service study.
- 23.3 AG-X customers must provide 1-year notice to return to APS's cost-of-service rates. At APS's option, customers seeking to return with less notice must pay market-based rates until the 1-year notice period is attained.
- 23.4 The Administrative Management Fee for the program will be increased to \$1.80 per MWh.
- 23.5 A retail energy imbalance protocol specifically designed to measure how well an AG-X Generation Service Provider ("GSP") is matching its retail buy-through customer load on an hourly basis will replace the FERC energy imbalance protocol. Energy Imbalance will be determined based on each GSP's aggregated hourly customer load.
- a. Within the range of +/- 15% each hour or +/- 2 MW, whichever is greater, GSPs would pay based on Schedule 4 of APS's OATT, which now reflects the terms of the CAISO imbalance charges.
 - b. Greater than 15% each hour or +/- 2 MW, whichever is greater, in addition to the charges in a.above, GSPs would pay a penalty of \$3 per MWh.
 - c. In addition to the imbalance provisions described above, GSPs with 20% of hourly deviations greater than 20% of the scheduled amount occurring in a calendar month will receive a notice of intent to terminate the GSP's eligibility in the program unless remedied. Imbalances of this magnitude and frequency will be deemed "Excessive." Should Excessive imbalances occur again in a subsequent month, within 12 months from the date of the notice, the GSP's eligibility may be terminated. To avoid termination, a GSP must demonstrate to APS that it is operating in good faith to match its resources to its load. In the event of GSP termination, the customer will be required to secure a replacement GSP within 60 days.
- 23.6 The PSA mitigation will remain in place. However the mitigation is modified such that the resale of capacity and energy displaced by AG-X is established at a flat \$1,250,000 per month of off-system sales margins

and excluded from the PSA rather than using a pro-rata share of such margins.

- 23.7 AG-X will remain at 200 MW but the prior restrictions as to 100 MW from each of the E-32L and E-34/35 rate schedules is eliminated; however, 100 MW would be allocated to 20 MW single-site customers with load factors above 70% unless not fully subscribed during the solicitation process.
- 23.8 Line losses for scheduling AG-X load will be modified to reflect transmission voltage service when applicable.
- 23.9 The 10 MW minimum aggregation level will be retained. Current provisions on the size of single site loads eligible for aggregation also will remain in place.
- 23.10 There will be a new lottery if the service is oversubscribed – otherwise, first come, first served. After the initial re-lottery, if necessary, customers who enter the program will not be required to participate in a subsequent lottery to remain in the program.
- 23.11 The AG-1 deferral will be recovered over 5 years from all non-residential customer classes, except the street and area lighting customer classes. The amount will be allocated to each class based on adjusted Test Year kWh. APS will not propose a deferral of unmitigated costs resulting from AG-X, if any, nor propose the collection of unmitigated costs resulting from AG-X, if any, before or in its next rate case. Attached as Appendix K is the AG-X rate schedule.

XXIV. MILITARY CUSTOMERS

- 24.1 The unbundled delivery charge for service at military-primary voltage under rates E-34 and E-35 will be reduced to a level that results in any applicable military customer getting a net impact bill increase equal to the average for all retail customers.

XXV. REVENUE SPREAD

- 25.1 For the revised revenue requirement, APS will keep the same revenue spread between Residential and General Service classes. However, within General Service, because GS extra small and small customers originally had a near zero net bill impact, the reduction will be spread to all other GS

customers proportionally to the original revenue spread. Attached as Appendix L is the revenue spread/targets summary.

XXVI. EFFECTIVE DATE OF RATE PLANS AND TRANSITION PLAN

- 26.1 The rate increase will go into effect on the effective date of the Commission's Decision in this case using transition rates which for purposes of this Agreement are defined as existing Residential and extra small General Service rate schedules with updated revenue requirements. Customers will have the opportunity to select any rate which they qualify for, and APS will provide them information on options that would minimize their bill. Customers that do not select a different rate will transition to the updated rate plan most like their existing rate on or before May 1, 2018. At least 90 days before transitioning customers who have not selected a rate, APS will provide a report to the ACC indicating the total number of customers who have not made a selection.

XXVII. FIVE MILLION DSMAC ALLOCATION

- 27.1 APS will make a one-time allocation of \$5 million from over-collected DSMAC funds to DSM programs for education and to help customers manage new rates and rate options including services and tools available to customers to help them manage their utility costs. APS shall file an outreach and education plan and shall provide stakeholders with an opportunity for review and comment on the draft plan prior to completing its final plan.

XXVIII. AZ SUN II

- 28.1 APS will implement a new program for utility-owned solar distributed generation. The purpose of this program is to expand access to rooftop solar for low and moderate income Arizonans. For this program, distributed generation will be defined as photovoltaic solar generation connected to the distribution system. APS will use third-party solar contractors to install the solar systems. The third-party solar contractors will be competitively selected through an RFP process. APS will own all the generation, renewable energy credits and other attributes from this program.
- 28.2 All reasonable and prudent costs incurred by APS pursuant to this program will be recoverable through the Renewable Energy Adjustment Clause until the next rate case.

- a. Expenses eligible for recovery through the Renewable Energy Adjustment Clause include all O&M expenses, property taxes, marketing and advertising expenses, and the capital carrying costs of any capital investment by APS through this program (depreciation expenses at rates established by the Commission, and return on both debt and equity at the pre-tax weighted average cost of capital).
- b. APS may request that the capital costs of the solar systems installed under this program be included in rate base in its next rate case.
- c. APS's expenses under this program may be reviewed for prudence in each annual REST docket. Further, if APS includes any of these solar systems in rate base in the next rate case, those systems will be subject to a prudence review in that case.
- d. APS will propose a program not less than \$10 million per year, and not more than \$15 million per year, in direct capital costs for the program. At least 65% of annual program will be dedicated to residential installations as defined in subsection 28.4.b. At the end of nine months of each program year, any unspent funds dedicated to low income residential installations can be used for other eligible customers.
- e. Relation to annual REST docket. The program is approved in this Docket, and APS does not need to seek further approval in the REST Docket for the program or the spending authorized herein. However, APS shall report the number of installations, capital costs, and expenses in each annual REST docket. Further, recovery of the expenses through the Renewable Energy Adjustment Clause will be reviewed in the annual REST dockets as described herein.

28.3 This program will be available throughout APS's service area, including in rural Arizona.

28.4 This program is limited to low and moderate income residential APS customers as defined below, as well as non-profits that serve low or moderate income APS residential customers, Title I schools, and rural government customers. Rural government is defined as any state, local or tribal government entity in or serving a rural municipality. Rural Municipality means Arizona incorporated cities and towns with

populations of less than 150,000 (based on U.S. Census Bureau 2010 population data) not contiguous with or situated within a Metro Area. Metro Area means a city with a population of 750,000 or more and its contiguous and surrounding communities.

- a. Moderate income is defined as a household earning less than 100% of the median Arizona household income. APS will verify the income of each program participant.
 - b. Low income is defined as a household with income at or below 200% of the federal poverty level. APS will verify the income of each program participant.
- 28.5 APS may include any multi-family housing (such as apartment buildings) in the program.
- 28.6 Each residential APS customer participating in the program, upon installation of the solar system, will receive a bill credit of \$10-50 per month applied to their APS bill. APS will work with stakeholders to discuss and determine the reasonable level of bill credit dependent upon type of installation. All other terms and conditions of the customer's rate option will continue to apply.
- 28.7 This program is approved for a period of three years from and after the date APS files a notice of program commencement in this Docket. APS will file the notice no later than three months after the effective date of the Commission's decision in this Docket. APS agrees to not implement any additional utility-owned residential solar distribution generation programs prior to APS's next general rate case beyond AZ Sun II, as outlined above.
- 28.8 APS will file a report with the Commission on the status of the program every quarter during the term of the program. The reporting will list the number of installs in each eligible category until the next APS rate case.

XXIX. LIMITED INCOME PROGRAMS

- 29.1 The E-3 Energy Support Program for limited income customers will be revised to provide eligible customers with a flat 25% bill discount.
- 29.2 The E-4 Medical Support Program for limited income customers who have life sustaining medical equipment will be revised to provide eligible customers with a flat 35% bill discount.

- 29.3 APS agrees to fund \$1.25 million annually the crisis bill program to assist customers whose incomes are less than or equal to 200% of the Federal Poverty Income Guidelines.

XXX. AMI OPT-OUT/SCHEDULE 1

- 30.1 The AMI Opt-Out program will be approved as proposed by APS except the fees will be changed to reflect an upfront fee of \$50 to change out a standard meter for a non-standard meter and monthly fee of \$5. See Service Schedule 1, attached as Appendix M.
- 30.2 Changes to Schedule 1 are attached in Appendix M.

XXXI. SCHEDULE 3

- 31.1 APS will create a new classification in Schedule 3: "Rural Municipal Business Developments" which means a tract of land that has (1) been divided into contiguous lots, (2) is owned and developed by a Rural Municipality and, (3) where the Rural Municipality will be the lease-holder for future, permanent lessee applicants.
- 31.2 Extension Facilities will be installed to Rural Municipal Business Developments on the basis of an Economic Feasibility analysis in advance of an application for service by permanent lessee applicants.
- 31.3 The refund eligibility period will be seven years (Rather than 5 years that applies to other classifications).
- 31.4 Advance payment of one-half of the project costs is due before the start of Company construction. The balance of the project cost will be required 7 years from the Execution Date of the agreement if the project has not become economically feasible by the end of the refundable period. Any unrefunded advance balance paid at the start of the project plus the balance of project costs due at the end of the refund period will become a non-refundable contribution in aid of construction 7 years from the Execution Date of the agreement. (Rather than full advance required before start of construction). Changes to Schedule 3 are attached as Appendix N.

XXXII. LOST FIXED COST RECOVERY MECHANISM

- 32.1 The LFCR opt-out rate option approved in Decision 73183 will be removed.

32.2 The adjustment will no longer be applied to customer's bills as an equal percentage surcharge, but rather as a capacity (demand) charge per kW for customers with a demand rate and as a kWh charge for customers with a two-part rate without demand.

32.3 APS shall submit its LFCR compliance filings on February 15th of each year. New LFCR rates shall take effect, upon Commission approval, with the first billing cycle in May of each year. The LFCR Plan of Administration is attached as Appendix O.

XXXIII. MODIFICATION TO ENVIRONMENTAL IMPROVEMENT SURCHARGE

33.1 APS shall be permitted to increase the cumulative per kWh cap rate for the Environmental Improvement Surcharge ("EIS") from the current \$0.00016 to a new rate of \$0.00050 and include a balancing account.

33.2 A copy of the revised EIS Plan of Administration is attached as Appendix P.

XXXIV. TRANSMISSION COST ADJUSTMENT MECHANISM

34.1 APS shall be permitted to add a balancing account to the TCA.

34.2 Consistent with the Commission's directive in Decision No. 72430, the annual TCA adjustment will become effective June 1 of each year without the need for affirmative Commission approval, consistent with the process approved by the Commission in Decision No. 72430.

34.3 A copy of the proposed TCA Plan of Administration is attached as Appendix Q.

XXXV. CHALLENGES TO DECISION NOS. 75859 AND 75932

35.1 Upon final approval of the Settlement Agreement by way of a final non-appealable Commission Order that includes no material changes to the terms of the Settlement Agreement, all Signing Parties will promptly take all necessary actions to (i) withdraw any challenge to Decision Nos. 75859 and 75932 they have filed. and (ii) refrain from pursuing any legal challenge to Decision Nos. 75859 and 75932 in any forum.

35.2 Prior to the issuance of a non-appealable Commission Order in this rate case, the Signing Parties agree to work together to secure a stay of any and

all appeals that will suspend the filing of all pleadings, motions, briefings, or other court documents, until after the Commission issues its final Order in this case.

XXXVI. POWER SUPPLY ADJUSTOR AUDIT

- 36.1 Staff will docket the final audit report of APS's Power Supply Adjustor ("PSA") and the Signing Parties agree that any issues relating to the PSA audit report will be addressed in the hearing on this matter.

XXXVII. COMPLIANCE MATTERS

- 37.1 Staff's Recommendation for elimination or waiver of certain compliance requirements will be adopted. A list of the items to be eliminated or waived is attached as Appendix R.
- 37.2 Within ten days after the Commission issues an order in this matter, APS shall file compliance schedules associated with this Docket for Staff review. Subject to Staff review, such compliance schedules will become effective on the effective date of the new rates contained in this Agreement.

XXXVIII. FORCE MAJEURE PROVISION

- 38.1 Nothing in this Agreement shall prevent APS from requesting a change to its base rates in the event of conditions or circumstances that constitute an emergency. For the purposes of this Agreement, the term "emergency" is limited to an extraordinary event that, in the Commission's judgment, requires base rate relief in order to protect the public interest. This provision is not intended to preclude any party, including any Signing Party to this Agreement, from opposing an application for rate relief filed by APS pursuant to this paragraph. Nothing in this provision is intended to limit the Commission's ability to change rates at any time pursuant to its lawful authority.

XXXIX. COMMISSION EVALUATION OF PROPOSED SETTLEMENT

- 39.1 All currently filed testimony and exhibits shall be offered into the Commission's record as evidence.
- 39.2 The Signing Parties recognize that Staff does not have the power to bind the Commission. For purposes of proposing a settlement agreement, Staff acts in the same manner as any party to a Commission proceeding.

- 39.3 This Agreement shall serve as a procedural device by which the Signing Parties will submit their proposed settlement of APS's pending rate case, Docket No. E-01345A-16-0036 consolidated with Docket No. E-01345A-16-0123, to the Commission.
- 39.4 The Signing Parties recognize that the Commission will independently consider and evaluate the terms of this Agreement. If the Commission issues an order adopting all material terms of this Agreement, such action shall constitute Commission approval of the Agreement. Thereafter, the Signing Parties shall abide by the terms as approved by the Commission.
- 39.5 If the Commission fails to issue an order adopting all material terms of this Agreement, any or all of the Signing Parties may withdraw from this Agreement, and such Signing Party(ies) may pursue without prejudice their respective remedies at law. For the purposes of this Agreement, whether a term is material shall be left to the discretion of the Signing Party choosing to withdraw from the Agreement. If a Signing Party withdraws from the Agreement pursuant to this paragraph and files an application for rehearing, the other Signing Parties, whether or not the party has withdrawn from the Agreement, except for Staff, shall support the application for rehearing by filing a document with the Commission that supports approval of and future adherence to the Agreement in its entirety. Staff shall not be obligated to file any document or take any position regarding the withdrawing Signing Party's application for rehearing.

XL. MISCELLANEOUS PROVISIONS

- 40.1 This case has attracted a large number of participants with widely diverse interests. To achieve consensus for settlement, many participants are accepting positions that, in any other circumstances, they would be unwilling to accept. They are doing so because this Agreement, as a whole, is consistent with with the broad public interest. The acceptance by any Signing Party of a specific element of this Agreement shall not be considered as precedent for acceptance of that element in any other context.
- 40.2 No Signing Party is bound by any position asserted in negotiations, except as expressly stated in this Agreement. No Signing Party shall offer evidence of conduct or statements made in the course of negotiating this Agreement before this Commission, any other regulatory agency, or any court, and no statement, communication or position of any party, their

representatives, attorneys, or witnesses in the course of negotiations or in support of this Agreement shall be considered an admission or support for any position taken in any other forum or action.

- 40.3 Neither this Agreement nor any of the positions taken in this Agreement by any of the Signing Parties may be referred to, cited, or relied upon as precedent in any proceeding before the Commission, any other regulatory agency, or any court for any purpose except to secure approval of this Agreement and enforce its terms.
- 40.4 To the extent any provision of this Agreement is inconsistent with any existing Commission order, rule, or regulation, this Agreement shall control.
- 40.5 Each of the terms of this Agreement is in consideration of all other terms of this Agreement. Accordingly, the terms are not severable.
- 40.6 The Signing Parties shall make reasonable and good faith efforts necessary to obtain a Commission order approving this Agreement. The Signing Parties shall support and defend this Agreement before the Commission. Subject to subsection 40.5, if the Commission adopts an order approving all material terms of the Agreement, the Signing Parties will support and defend the Commission's order before any court or regulatory agency in which it may be at issue.
- 40.7 This Agreement may be executed in any number of counterparts and by each Signing Party on separate counterparts, each of which when so executed and delivered shall be deemed an original and all of which taken together shall constitute one and the same instrument. This Agreement may also be executed electronically or by facsimile.

**Arizona Public Service Company
Proposed Settlement Agreement
Docket Nos. E-01345A-16-0036 & E-01345A-16-0123**

SIGNATURE PAGE

ARIZONA CORPORATION COMMISSION

By: 

Name: Elijah Abinah

Title: Acting Director, Utilities Division

Date: March 24, 2017

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Arizona Public Service Company

By: Barbara Lockwood

Name: Barbara Lockwood

Title: Vice President, Regulation

Date: March 24, 2017

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Residential Utility Consumer Office

By: David Tenney

Name: David Tenney

Title: Director

Date: 3/24/17

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SIGNATURE PAGE

[Arizona Utility Ratepayer Alliance]

By:  _____

Name: Patrick J Quinn

Title: Managing Partner

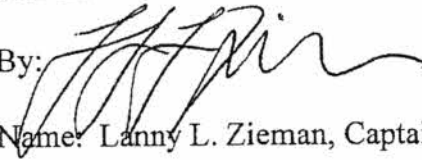
Date: March 24, 2017

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FEDERAL EXECUTIVE AGENCIES

By:



Name: Lanny L. Zieman, Captain, USAF

Title: Utilities Litigation Attorney

Date: 24 March 2017

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SIGNATURE PAGE

ARIZONA SOLAR DEPLOYMENT
ALLIANCE

By: _____

A handwritten signature in black ink, appearing to read 'S M Seitz', written over a horizontal line.

Name: SEAN M. SEITZ

Title: PRESIDENT

Date: MARCH 24, 2017

**Arizona Public Service Company
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SIGNATURE PAGE

[INSERT PARTY NAME/COMPANY]

By: Thomas A. Harris

Name: Tom Harris

Title: Treasurer, AriSEIA

Date: Mar. 24, 2017

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SIGNATURE PAGE

Vote Solar

[INSERT PARTY NAME/COMPANY]

By: 

Name: Adam Brown

Title: Executive Director

Date: 3/24/17

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Proposed Settlement Agreement
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Solar Energy Industries Association

By: _____

Name: Sean Gallagher

Title: Vice-President State Affairs

Date: 3/24/17

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SIGNATURE PAGE

**ENERGY FREEDOM
COALITION OF AMERICA**

By: _____

Name: Court S. Rich

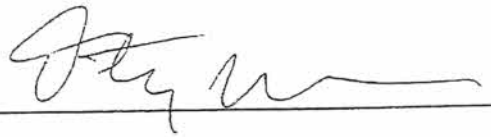
Title: Attorney for Energy Freedom
Coalition of America, LLC

Date: 3/27/17

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Arizona School Boards Association and the
Arizona Association of School Business
Officials

By: 

Name: Timothy M. Hogan

Title: Attorney

Date: 3/23/17

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SIGNATURE PAGE

**ARIZONANS FOR ELECTRIC
CHOICE AND COMPETITION**

By: 

Name: Stan Barnes

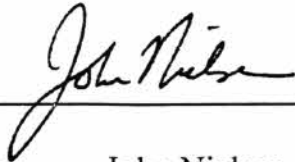
Title: President

Date: March 24, 2017

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WESTERN RESOURCE ADVOCATES

By: 

Name: John Nielsen

Title: Clean Energy Program Director

Date: 3/24/2017

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Wal-Mart Stores, Inc. and Sam's West, Inc.

By: Scott Wakefield

Name: Scott Wakefield

Title: Attorney

Date: March 24, 2017

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Docket Nos. E-01345A-16-0036 & E-01345A-16-0123

LUBIN & ENOCH, P.C.

By: _____

Name: Nicholas J. Enoch, Esq.

Title: Attorney for Intervenors

IBEW Locals 387 & 769

Date: March 24, 2017

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**FREEPORT MINERALS
CORPORATION**

By: Michael McElrath

Name: Michael McElrath

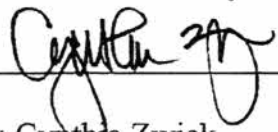
Title: Director Energy

Date: March 24, 2017

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[INSERT PARTY NAME/COMPANY]

By:  _____

Name: Cynthia Zwick

Title: Executive Director,
Arizona Community Action Assoc.

Date: March 24, 2017

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[INSERT PARTY NAME/COMPANY]

By: K. Bachm

Name: KURT Bachm

Title: ATTORNEY, The Kroger Co

Date: 8/24/2017

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ARIZONA INVESTMENT COUNCIL

By: 

Name: Gary Yaquinto

Title: President & CEO

Date: 3/24/2017

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SIGNATURE PAGE

Property Owners & Residents Association
(PORA) Sun City West

By: Al Gervenack

Name: Al Gervenack _____

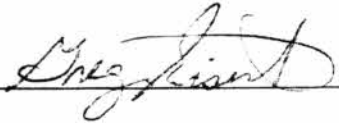
Title: Director, Board of Directors

Date: March 24, 2017 _____

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SIGNATURE PAGE

[SUN CITY HOME OWNERS
ASSOCIATION (SCHOA)]

By: 

Name: GREG EISERT

Title: Director, Chairman of Government
Affairs

Date: 24 March 2017

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REP America d/b/a ConservAmerica

By: Timothy J. Sabo

Name: Timothy J. Sabo

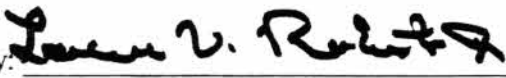
Title: Attorney for ConservAmerica

Date: 3/24/17

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SIGNATURE PAGE

Constellation New Energy, LLC

By: 

Name: Lawrence V. Robertson, Jr.

Title: Attorney

Date: March 24, 2017

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SIGNATURE PAGE

Direct Energy Business, LLC

By: Lawrence V. Robertson, Jr.

Name: Lawrence V. Robertson, Jr.

Title: Attorney

Date: March 24, 2017

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SIGNATURE PAGE

Calpine Energy Solutions, LLC

By: Lawrence V. Robertson, Jr.

Name: Lawrence V. Robertson, Jr.

Title: Attorney

Date: March 24, 2017

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SIGNATURE PAGE

[Arizona Competitive Power Alliance]

By:  _____

Name: Greg Patterson

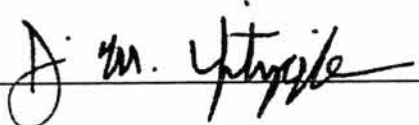
Title: AzCPA Director

Date: March 24, 2017

**Arizona Public Service Company
Proposed Settlement Agreement
Docket Nos. E-01345A-16-0036 & E-01345A-16-0123**

SIGNATURE PAGE

CITY OF COOLIDGE

By: 

Name: Denis M. Fitzgibbons


Title: City of Attorney

Date: March 24, 2017

**Arizona Public Service Company
Proposed Settlement Agreement
Docket Nos. E-01345A-16-0036 & E-01345A-16-0123**

SIGNATURE PAGE

Granite Creek Farms LLC
Granite Creek Power & Gas LLC

By: 
Name: Thomas E Stewart _____

Title: General Manager _____

Date: 3/26/2017 _____

Appendix M



SERVICE SCHEDULE 1
TERMS AND CONDITIONS FOR
STANDARD OFFER AND DIRECT ACCESS SERVICES

Terms and Conditions

The following Terms and Conditions and any changes authorized by law will apply to Standard Offer and Direct Access services made available by Arizona Public Service Company (APS or Company). These Terms and Conditions are considered a part of all rate schedules, except where specifically excluded or changed by a written agreement. For a Customer whose service requirements are of unusual size or characteristics, additional or special contract arrangements may be required. If there is a conflict between any provision of a rate schedule and these Terms and Conditions, the provisions of the rate schedule apply.

1. Application for Service

Before supplying service APS will verify the identity of Applicant. Applicants may be required to appear at Company's place of business to produce proof of identity, sign an application, or execute a contract for service before APS supplies service. If there is no signed application or contract for service, APS's standard contract terms apply and the supplying of Standard Offer or Direct Access services and Customer's acceptance of service forms a service agreement between APS and the Customer for delivery, acceptance, and payment for services.

1.1 Grounds for Refusal of Service - APS may refuse service if any of the following conditions exist:

- (A) The Applicant has an outstanding amount due with APS for the same class of service and is unwilling to make payment arrangements that are acceptable to Company.
- (B) A condition exists that in Company's judgment is unsafe or hazardous.
- (C) The Applicant has failed to meet APS's security-deposit requirements outlined in Section 3.
- (D) The Applicant is known to be in violation of a Company Tariff.
- (E) The Applicant fails to furnish the funds, service, equipment, rights-of-way or Easements required to serve the Applicant and that have been specified by APS as a condition for providing service.
- (F) The Applicant falsifies his or her identity for the purpose of obtaining service.
- (G) Service is already being provided at the address for which the Applicant is requesting service.
- (H) Service is requested by an Applicant, and a prior Customer, who will reside at, or benefit from service at the premises, owes APS a delinquent bill for the same class of service, from the same or a prior service address.
- (I) The Applicant has failed to obtain any required permit or inspection indicating that the Applicant's facilities comply with current local construction and safety codes.

ARIZONA PUBLIC SERVICE COMPANY
Phoenix, Arizona
Filed by: Charles A. Miessner
Title: Manager, Regulation and Pricing
Original Effective Date: December 1951

A.C.C. No. xxxx
Canceling A.C.C. No. 5804
Service Schedule 1
Revision No. 36
Effective: xxxx xx, xxxx



SERVICE SCHEDULE 1
TERMS AND CONDITIONS FOR
STANDARD OFFER AND DIRECT ACCESS SERVICES

2. Service-Establishment Charges

A Service-Establishment Charge of \$8.00 for residential or \$33.00 non-residential plus applicable adjustments will be assessed each time APS is asked to establish or re-establish electric service, or to make a special read without a disconnect and calculate a bill for a partial month.

2.1 Multiple Connects - If multiple connects are performed during the same site visit, in the same Applicant name, at the same address, and for the same class of service, APS will assess the Service-Establishment Charge once for every two Delivery Points.

2.2 After-hours Charge -The Customer must also pay an after-hours charge plus applicable adjustments if the Customer requests service, as defined in A.A.C. R14-2-203.D.3, be established or re-established after 5:00 p.m. on a day other than the day of request. The after-hours charge will be \$8.00 for residential with standard metering, \$137.00 plus applicable adjustments for residential with non-standard metering or \$164.00 plus applicable adjustments for non-residential.

2.3 Same-Day Connect Charge - The Customer must also pay a same-day connect charge of \$87.00 plus applicable adjustments if the Customer requests service, as defined in A.A.C. R14-2-203.D.3, be established or re-established on the same business day the request is being made, and APS agrees to work the request on the same day of the request. This will be charged regardless of the time the order may be worked by APS on that day. APS may, where no additional costs are incurred by Company, waive the same-day fee.

2.4 Non-Standard Service Request Charge -The Customer must also pay \$164.00 plus applicable adjustments per crew-person per hour when Customer requests services that do not meet the definition of Service-Establishment as defined in A.A.C. R14-2-203.D.3 and that require the availability of Company representatives after-hours, on a weekend day, or on a Company holiday. Examples of non-standard service requests are Customer-requested outages for maintenance and metering-equipment installations that include instrument transformers. The number of representatives used by APS to fulfill a request is in the Company's sole discretion. Customers will be given notice of estimated charges before the work is performed.

2.5 Waiving of Service Establishment Charge - Company may waive the Service-Establishment Charge if:

(A) The establishment of service is effective with the last Meter read date billed and a field trip is not required because Applicant accepts responsibility for energy billed and not yet paid.

(B) Applicant has an active Landlord Automatic Transfer of Service Agreement on file with Company.



**SERVICE SCHEDULE 1
TERMS AND CONDITIONS FOR
STANDARD OFFER AND DIRECT ACCESS SERVICES**

3. Establishing Credit, Security Deposits and other forms of Credit Assurance

When credit cannot be established as provided for in Section 3.1 and 3.2 or when it is determined that the Applicant left an unpaid final bill owed to another utility company, the Applicant will be required to place a security deposit to secure payment of bills for service.

3.1 Residential Establishment of Credit - APS will not require a security deposit from a new Applicant for service at a primary or secondary residence if the Applicant can meet any of the following requirements:

- (A) The Applicant has had service of a comparable nature with APS within the past two years and was not delinquent in payment more than twice during the last 12 consecutive months or been disconnected for nonpayment.
- (B) Company receives an acceptable credit rating, as determined by Company, for the Applicant from a credit-rating agency used by Company.
- (C) The Applicant can produce a letter regarding verification of credit from an electric utility where service of a comparable nature was last received within six months of the current date, and the utility states that the Applicant had a timely payment history for the prior 12 consecutive months.
- (D) If in lieu of a security deposit, Company receives an acceptable deposit-guarantee notification from a social or governmental agency or a surety bond in a sum equal to the required deposit.

3.2 Nonresidential Establishment of Credit - All nonresidential Applicants will be required to place a cash deposit to secure payment of bills for service, unless:

- (A) The Applicant had service of a comparable nature with Company within the past two years and was not delinquent in payment more than twice during the last 12 consecutive months and was not disconnected for nonpayment.
- (B) The Applicant provides a noncash security deposit in the form of a surety bond, irrevocable letter of credit, or assignment of monies in an amount equal to the required security deposit.

3.3 General Deposits Guidelines - If a security deposit is required, a separate deposit may be required for each service location.

- (A) Customer's security deposits will not preclude Company from terminating an agreement for service or suspending service if Customer fails to meet service-agreement obligations.
- (B) Company may choose to accept less than the full deposit required at time of service establishment based on Customer's financial condition.
- (C) A security deposit may increase or decrease if the Customer's average consumption increases or decreases by more than 10% for residential accounts



SERVICE SCHEDULE 1
TERMS AND CONDITIONS FOR
STANDARD OFFER AND DIRECT ACCESS SERVICES

or 5% for nonresidential accounts within 12 consecutive months and credit has not been established.

(D) Where three or more additional residential services are requested, Company may require Customer to establish or reestablish a security deposit.

3.4 Residential Security Deposits - Residential security deposits will not exceed two times the Customer's average monthly bill as estimated by Company. APS may require a residential Customer to establish or reestablish a security deposit if the Customer becomes delinquent in the payment of two or more bills within a 12 consecutive month period or has been disconnected for non-payment during the last 12 months.

3.5 Nonresidential Security Deposits - Nonresidential security deposits will not exceed two and one-half times the Customer's maximum monthly billing as estimated by Company. APS may require a nonresidential Customer to establish or reestablish a security deposit if the Customer becomes delinquent in the payment of two or more bills within 12 consecutive months or if the Customer has been disconnected for nonpayment during the last 12 months, or when the Customer's financial condition may jeopardize the payment of the bill, as determined by Company based on the results of using a credit-scoring worksheet. Company will inform all Customers of the Arizona Corporation Commission's complaint process should the Customer dispute the deposit based on the financial data.

3.6 Deposit Interest - Cash deposits held by APS six months (183 days or longer) earn interest from the date the deposit was collected at the established one-year Treasury Constant Maturities rate, effective on the first business day of each year, as published on the Federal Reserve Website.

3.7 Deposit Refunds - If the Customer terminates all service with Company, their security deposit may be credited to any remaining final bills. Any remaining credit balance will be refunded to the Customer of record within 30 days.

3.8 Residential security deposits or other instruments of credit will automatically expire or be credited or returned to the Customer's account after 12 consecutive months of service, if the Customer has not been delinquent in payments more than twice and the Customer has not filed bankruptcy in the last 12 months.

(A) Nonresidential security deposits and noncash deposits on file with Company will be reviewed after 24 months of service and will be returned if:

- (1) The Customer has not been delinquent in payments more than twice, has not been disconnected for non-payment, and has not filed for bankruptcy during the previous 12 consecutive months; and
- (2) Customer's financial condition does not warrant an extension of the security deposit.



SERVICE SCHEDULE 1
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STANDARD OFFER AND DIRECT ACCESS SERVICES

4. Rates

The Customer's service characteristics and service requirements determine the selection of the applicable rate schedule.

4.1 Rate Selection - APS will use reasonable care in initially establishing service to the Customer under the most advantageous rate schedule applicable to the Customer. Because of varying Customer usage patterns and other reasons beyond APS's reasonable knowledge or control, Company cannot guarantee that the most economic applicable rate will be applied. APS will not make any refunds in any instance where it is determined that the Customer would have paid less for service had the Customer been billed on an alternate rate or provision of that rate.

4.2 Rate Information - APS will provide, in accordance with A.A.C. R14-2-204, a copy of any rate schedule applicable to the Customer for the requested type of service. In addition, APS will notify its Customers of any changes in Company Tariff affecting those Customers.

4.3 Optional Rates - Optional rate schedules are available for certain classes of service. After establishing service a Customer may choose an alternate rate schedule effective from the next regularly scheduled Meter reading, after the appropriate metering equipment is reprogrammed or installed. No further rate schedule changes may be made within the succeeding 12 month period. If the rate schedule or contract under which the Customer is provided service specifies a term, the Customer may not exercise its option to select an alternate rate schedule until expiration of that term.

5. Billing

Billing Periods for service normally consist of approximately 30 days unless otherwise designated under rate schedules, through contractual agreement, or at Company option.

5.1 Payment of Bills - The Customer is responsible for paying bills until service is ordered discontinued and Company has had reasonable time to secure a final Meter reading for those services involving energy usage, or, if nonmetered services are involved, until Company has had reasonable time to process the disconnect request.

5.2 Failure to Receive Bills or Notices (including notices of disconnection) which have been properly placed in the United States mail or sent through alternative billing forms, such as electronic mail, will not prevent such bills from becoming delinquent or prevent the notices from being effective, or relieve the customer of their obligations.

5.3 Incentive for Electronic Payments - A monthly incentive of \$0.48 per Customer will be given to Customers who elect to pay their bills using the Company's electronically transmitted payment options AutoPay, SurePay or similar programs.



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TERMS AND CONDITIONS FOR
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- 5.4 Billing Errors** - When an error is found in the billing sent to the Customer, APS will correct the error to recover or refund the difference between the original billing and the correct billing. Adjusted billings will not be sent for periods beyond the applicable statute of limitations from the date the error is discovered.
- 5.5 Corrected Charges for Overbilling** - Refunds or credits to Customers resulting from overbillings will be made promptly upon discovery by Company.
- 5.6 Corrected Charges for Underbilling** - Except as specified below, corrected charges for underbillings will be limited to three months for residential accounts and six months for nonresidential accounts. Customers will be given an equal length of time, such as the number of months underbilled, to pay the backbill without late-payment penalties. Where the account is billed on a special contract or nonmetered rate, corrected charges for underbillings will be billed in accordance with the contract or rate-schedule requirements and is not limited to three or six months as applicable.
- (A) Where service has been established but no bills have been rendered, corrected charges for underbillings will go back to the date service was established.
 - (B) Where there is evidence of Meter Tampering or energy diversions, corrected charges for underbillings will go back to the date Meter Tampering or energy diversions began, as determined by Company, and APS is not required to give an equal length of time, such as the number of months underbilled, to pay the backbill. APS will work with Customer to establish a payment plan that is acceptable to Company.
 - (C) Where lack of access to the Meter (caused by the Customer) has resulted in estimated bills, corrected charges for underbillings will go back to the Billing Month of the last Company-obtained Meter-read date.
 - (D) Where actual Customer usage can be determined without estimating reads, corrected charges for underbillings are not limited to three or six months, as applicable. In no event may such rebilling exceed the applicable statute of limitations.
- 5.7** Company may forgo correcting a billing error if the amount over or under billed is de minimis and the cost of rebilling does not justify the cost and time required to rebill.

6. Collection Policy

The following collection policies apply to all Customer accounts:

- 6.1 Delinquent Bills** - All bills rendered by Company are due and payable no later than 15 calendar days from the billing date. Any payment not received within this time frame are delinquent. All delinquent accounts, for which payment has not been received, are subject to the provisions of Company's termination procedure.

ARIZONA PUBLIC SERVICE COMPANY
Phoenix, Arizona
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SERVICE SCHEDULE 1
TERMS AND CONDITIONS FOR
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Company may suspend or terminate a Customer's service for nonpayment of any Arizona Corporation Commission approved charges.

6.2 Late Charges - All delinquent charges, including past due security deposits, are subject to a late charge at the rate of 18% per annum (1.5% per month) plus applicable adjustments.

6.3 Transfer of Outstanding Bills - If a Customer has two or more services with APS and one or more services are terminated for any reason leaving an outstanding bill, and the Customer is unwilling to make payment arrangements that are acceptable to Company, Company may transfer the balance due on the terminated service to any other active account of the Customer for the same class of service. The Customer's failure to pay the active account will result in the suspension or termination of service. If service is requested by two or more individuals, Company has the right to collect the full amount owed from any one of the Customers.

6.4 Dishonored Payments - If Company is notified by the Customer's financial institution that it will not honor a payment tendered by the Customer for payment of any bill, Company may require the Customer to make payment in cash, or by money order, certified or cashier's check, or other means that guarantee the Customer's payment to Company.

(A) The Customer will be charged a fee of \$15.00 plus applicable adjustments for each instance where the Customer's payment is not honored by the Customer's financial institution.

(B) The tender of a dishonored payment in no way relieves the Customer of the obligation to pay Company under the original terms of the bill, or defers the Company's right to terminate service for nonpayment of bills.

(C) Where the Customer has tendered two or more dishonored payments in the past 12 consecutive months, Company may require the Customer to make payment in cash, or money order or cashier's check for the next 12 consecutive months.

6.5 Collection Agency Referrals - All unpaid delinquent final bills may be referred to a collection agency for collection. If collection-agency referral is warranted, Customer may be responsible for the associated collection-agency fees incurred.

7. Termination of Service

7.1 To avoid termination of service, the Customer will make payment in full, including any necessary deposit as outlined in Section 3, or make payment arrangements that are satisfactory to Company.

7.2 If service is terminated, APS will not restore service until the conditions which resulted in the termination have been corrected to the satisfaction of Company.



**SERVICE SCHEDULE 1
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APS may also require payment of Same-Day and After-Hours charges prior to restoring service

7.3 Termination of Service With Notice - APS may, without liability for injury or damage, and without making a personal visit to the site, disconnect service to any Customer for any of the reasons stated below, if Company has met the notice requirements established by the Arizona Corporation Commission:

- (A) Customer's violation of any applicable rules of the Arizona Corporation Commission or Company Tariff.
- (B) A Customer's failure to pay a Delinquent Bill for services provided by Company.
- (C) The Customer's breach of a written contract for service.
- (D) The Customer's failure to comply with Company's deposit requirements.
- (E) The Customer's failure to provide Company with satisfactory and unassisted access to Company's equipment.
- (F) When necessary to comply with an order of any governmental agency having jurisdiction.
- (G) A prior Customer's failure to pay a Delinquent Bill for utility services where the prior Customer continues to reside on the premises.
- (H) Failure to provide or retain rights-of-way or Easements necessary to serve the Customer.
- (I) Company learns of the existence of any condition in Section 1.1 - Grounds For Refusal of Service.

7.4 Termination of Service Without Notice - Company may, without liability for injury or damage, disconnect service to any Customer without advance notice under any of the following conditions:

- (A) If Company observes, or has evidence of, a hazard to the health or safety of persons or property;
- (B) If Company has evidence of Meter Tampering or fraud.
- (C) If Company has evidence of unauthorized resale or use of electric service.
- (D) The Customer fails to comply with the curtailment procedures imposed by Company during a supply shortage.

7.5 Termination of Service for Dishonored Payment - Before reconnecting service, payment of funds resulting from a dishonored payment and all other delinquent amounts will be required in cash, money order, or certified funds. If Customer has already received a notice of disconnection at the time the bill became past due, APS may, without liability for injury or damage, disconnect service without additional notice under any of the following conditions:

- (A) When Customer makes payments to avoid or stop disconnection with a dishonored payment and has already received a notice at the time the bill became past due.



**SERVICE SCHEDULE 1
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(B) When Customer pays to reconnect service with a dishonored payment and has already received a notice at the time the bill became past due.

7.6 Termination Process Charges - Company will require payment of a Field Call Charge of \$10.00 plus applicable adjustments when an authorized Company representative travels to the Customer's site to accept payment on a delinquent account, notify of service termination, make payment arrangements, or terminate the service. This charge only applies for field calls resulting from the termination process.

(A) If a termination is required at the pole the reconnection charge will be \$89.00 plus applicable adjustments.

(B) If a termination is in underground equipment the reconnection charge will be \$135.00 plus applicable adjustments.

8. Metering & Metering Equipment

8.1 Standard Metering - The Company's standard method of measuring energy usage is through the use of Automated Metering Infrastructure (AMI) metering equipment. All customers will be served using the Company's standard metering equipment unless:

(A) the customer is in a remote location where wireless technology is not available or AMI equipment cannot otherwise be used; or

(B) the customer meets all eligibility requirements for non-standard metering and voluntarily requests non-standard metering.

8.2 Non-Standard Metering - The Company's non-standard billing meter is the digital meter. A digital meter records energy electronically and displays the usage measurements. This meter does not employ any communications technology and must be read manually each month. Certain optional rates may not be available to customers who select a non-standard meter.

8.3 Non-Standard Metering Eligibility - Only residential customers, in whose name service is being provided, may request non-standard metering. Customers who have an existing, purchased or leased rooftop solar distributed generation (DG) system, or customers with newly installed rooftop solar, are not eligible for non-standard metering.

8.4 Non-Standard Metering Charges - The following charges will apply when a customer voluntarily requests, and is granted, non-standard metering as described in Section 8.1(B):

(A) Monthly Meter Reading Charge: \$5.00

(B) Non-Standard Metering Set-up Fee: A \$50.00 one-time charge for customers with existing AMI meter.



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(C) Customers in a remote location where wireless technology is not available or AMI equipment cannot otherwise be used [see 8.1(A)] will not be billed a non-standard meter reading charge.

8.5 Discontinuation of Non-Standard Metering - The Company may replace a non-standard meter with a standard meter, without notifying the customer prior to replacement, under any of the following conditions:

- (A) Company employees observe or have evidence of a safety hazard to employees, customers, or Company or customer property.
- (B) Company employees observe or have evidence of meter tampering, energy diversion, or fraud.
- (C) Company has evidence of unauthorized resale of electricity.
- (D) Company employees have received verbal or physical threats, including, but not limited to, verbal threats while installing meters or performing maintenance to Company equipment, and physical threats such as weapons or dogs.
- (E) All terms and conditions in Section 7, regarding termination of service, will also apply.

8.6 Measuring Customer Service - All energy sold to the Customer by Company will be measured by commercially acceptable measuring devices. Where it is impractical to meter loads, such as street lighting, security lighting, or special installations, consumption will be determined by Company. The readings of the Meter will be conclusive as to the amount of electric power supplied to the Customer unless there is evidence of Meter Tampering or energy diversion or unless a test reveals the Meter is in error by more than 3%, either fast or slow.

8.7 Meter Rereads - When requested by Customer, APS will reread the customer's Meter within 10 working days after the request. The cost of each reread is \$14.00 plus applicable adjustments if the original reading was not in error.

8.8 Meter Testing - APS tests its Meters regularly in accordance with a Meter testing and maintenance program approved by the Arizona Corporation Commission. APS will individually test a Company owned and maintained Meter upon Customer request.

If after testing, a Meter is found to be more than 3% in error, either fast or slow, correction will be made of previous readings and adjusted bills will be rendered.

8.9 Meter Test Charge - If the Meter is found to be within the plus or minus 3% limit, Company may charge the Customer \$44.00 plus applicable adjustments for Meter test if the Meter is removed from the site and tested in the meter shop, or \$93.00 plus applicable adjustments if the Meter remains on site and is tested in the field.

8.10 Meter Tampering - If there is evidence of Meter Tampering or energy diversion, the Customer, person, or entity demonstrated to have tampered with the Meter, or benefited from the tampering or diversion will be billed for the estimated



SERVICE SCHEDULE 1
TERMS AND CONDITIONS FOR
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energy and, if applicable, Demand, for the period in which the energy diversion took place. Additionally, where there is evidence of Meter Tampering, energy diversion, or by-passing the Meter, the Customer, person or entity demonstrated to have tampered with the Meter or diverted energy will also be charged the cost of the investigation as determined by Company.

- 9. Service Installations & Metering** - The Customer's service installation will normally be arranged to accept only one type of service at one Point of Delivery to enable service measurement through one Meter. If the Customer requires more than one type of service, or total service cannot be measured through one Meter according to Company's regular practice, separate Meters will be used and separate billing rendered for the service measured by each Meter.

9.1 Customer Equipment - The Customer must install and maintain all wiring and equipment beyond the Point of Delivery except for Company's Meters and special equipment. The Customer's entire installation must conform to all applicable construction standards and safety codes, and the Customer must furnish an inspection or permit if required by law or by Company. In circumstances where a clearance is not required by law, Company may require Customer to execute a Letter In-Lieu of Electrical Clearance. The Customer must also provide, in accordance with APS's current service standards and Electric Service Requirements Manual, at no expense to Company, and close to the Point of Delivery, a space that is, in the Company's opinion, both suitable and sufficient for installing, accessing and maintaining Company's metering equipment. A current version of the Electric Service Requirements Manual is available on-line on the Company's website.

9.2 Special Meter-Reading Device - Where a Customer requests, and Company approves, a special Meter-reading device or communications services or devices to accommodate the Customer's needs, the cost for the additional equipment and usage fees are the Customer's responsibility.

9.3 Totalized Metering and Billing - Company normally meters and bills each site separately. But, at Customer's request, adjacent and contiguous sites (not separated by private or public property or right of way), operated as one integral unit under the same name and as a part of the same business, may at Company's option, be considered a single site as specified in Company's Schedule 4, Totalized Metering of Multiple Service Entrance Sections at a Single Site for Standard Offer and Direct Access Service.

9.4 Service Connections - Company is not required to install or maintain any lines and equipment on the Customer's side of the Point of Delivery except its Meter.

(A) For overhead service, the Point of Delivery is where Company's service conductors terminate at the Customer's weatherhead or bus rider.



SERVICE SCHEDULE 1
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- (B) For underground service, the Point of Delivery is where Company's service conductors terminate in the Customer's or development's service equipment. The Customer must furnish, install, and maintain any risers, raceways, or termination cabinet necessary for installing Company's underground service conductors.
- (C) For special Applications where service is provided at voltages higher than the standard voltages specified in the Electric Service Requirements Manual, the designated Point of Delivery must be mutually agreed on by the parties.
- (D) For the mutual protection of the Customer and Company, only authorized employees or agents of Company or the Load Serving ESP are permitted to make and energize the connection between Company's service wires and the Customer's service entrance conductors. APS employees must carry Company-issued identification that they will show on request.

10. Customer Obligations

10.1 Load Characteristics - The Customer must exercise reasonable care to ensure that the electrical characteristics of its load, such as deviation from sine-wave form (a minimum standard is IEEE 519) or unusual short interval fluctuations in Demand, do not impair service to other Customers or interfere with operating any telephone, television, or other communication facilities. Customer must meet power factor requirements as specified in the applicable rate schedules.

10.2 Easements - All suitable Easements or rights-of-way required by Company for any portion of an extension to serve a Customer, which is either on sites owned, leased, or otherwise controlled by the Customer or developer, or other property required for the extension, will be furnished in Company's name by the Customer without cost to or condemnation by Company and in reasonable time to meet proposed service requirements. All Easements or rights-of-way granted to, or obtained on behalf of Company will contain terms and conditions that are acceptable to Company. When Company discovers that the Customer or the Customer's agent is performing work, has constructed facilities, or has allowed vegetation to grow, adjacent to or within an Easement or right-of-way or Company-owned equipment, and the work, construction, vegetation, or facility poses a hazard, or violates federal, state, or local laws, ordinances, statutes, rules, or regulations, or significantly interferes with Company's safe use, operation, or maintenance of, or access to, equipment, or facilities, Company will notify the Customer or the Customer's agent and take whatever actions are necessary to eliminate the hazard, obstruction, interference, or violation at the Customer's expense. Company will notify the Customer in writing of the violations.

10.3 Access for Repair, Maintenance and Service Restoration - Company's authorized agents must have satisfactory unassisted 24 hour a day, seven days a week access



SERVICE SCHEDULE 1
TERMS AND CONDITIONS FOR
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to Company's equipment located on Customer's sites for the purpose of repair, maintenance, and service-restoration work that Company may need to perform.

10.4 Access for Install, Inspect, Read, or Remove - Company's authorized agents must have satisfactory unassisted access to the Customer's sites at all reasonable hours to install, inspect, read, or remove its Meters or to install, operate, or maintain other Company property, to verify that Customer is in compliance with its obligations, or to inspect and determine the connected electrical load.

10.5 Trip Charge - A trip charge of \$22.00 for residential or \$26.00 for non-residential, plus applicable adjustments will be assessed each time an authorized Company representative travels to a site and is unable to complete a Customer's service request because of lack of access to the Point of Delivery.

10.6 Six Months No Access - If Company, in its opinion, does not have satisfactory unassisted access to the Meter after six months (not necessarily consecutive) of good-faith efforts to work with the Customer, then Company has sufficient cause to terminate service or deny any rate options where, in Company's opinion, access is required.

10.7 Remedies - The remedy for unassisted access will be at APS's discretion and may include the installation by Company of a specialized Meter. If a specialized Meter is installed, the Customer will be billed the difference between the otherwise applicable Meter for Customer's rate and the specialized Meter plus the cost incurred to install the specialized Meter as a one-time charge and any reoccurring incremental costs. If service is terminated as a result of failure to provide unassisted access, APS verification of unassisted access will be required before service is restored. Written termination notice is required before disconnecting service under this section.

11. Company Obligations

11.1 Customer-Specific Information - Customer-specific information will not be released without Customer's specific prior written authorization unless the information is requested by a law-enforcement or other public agency, or is requested by the Arizona Corporation Commission or its staff, or is reasonably required for legitimate account-collection activities, or is necessary to provide efficient, effective, safe, or reliable service to the Customer. Customer-specific information may be provided to suppliers of goods or services under contract with Company if the goods or services will help Company to provide efficient, effective, safe, or reliable service; and the contract includes a requirement that the information be kept confidential and be used only to fulfill the supplier's obligations to Company.

11.2 Service Voltage - Company will deliver electric service to the designated Point of Delivery, as specified in Section 9.4 of this Schedule, at the standard voltages

ARIZONA PUBLIC SERVICE COMPANY
Phoenix, Arizona
Filed by: Charles A. Miessner
Title: Manager, Regulation and Pricing
Original Effective Date: December 1951

A.C.C. No. xxxx
Canceling A.C.C. No. 5804
Service Schedule 1
Revision No. 36
Effective: xxxx xx, xxxx



SERVICE SCHEDULE 1
TERMS AND CONDITIONS FOR
STANDARD OFFER AND DIRECT ACCESS SERVICES

specified in the Company's Electric Service Requirements Manual and as specified in A.A.C. R14-2-208.F. Company may deliver service for special applications at higher voltages, with prior approval from Company's Engineering Department and in accordance with Company's Schedule 3, Conditions Governing Extensions of Electric Distribution Lines and Services approved by the Arizona Corporation Commission.

12. Limitations on Liability of Company

12.1 Service Interruptions - Company is not liable to the Customer for any damages caused by Load Serving Electric Service Provider's equipment or failure to perform, fluctuations, interruptions, or curtailment of electric service, except where caused by Company's willful misconduct or gross negligence.

- (A) Company may, without incurring any liability, suspend the Customer's electric service for periods reasonably required to permit Company to accomplish repairs to, or changes in, any Company's facilities.
- (B) The Customer is responsible for protecting Customer's own sensitive equipment from harm caused by variations or interruptions in power supply.
- (C) If a national emergency or local disaster results in disruption of normal service, Company may, in the public interest and on behalf of Electric Service Providers or Company, interrupt service to other Customers to provide necessary service to civil-defense or other emergency-service agencies on a temporary basis until normal service to these agencies can be restored.

12.2 Use of Service or Apparatus - The Customer will save Company harmless from and against all claims for injury or damage to persons or property occasioned by or in any way resulting from the services being provided by Company or their use on the Customer's side of the Point of Delivery. Company has the right to suspend or terminate service if Company learns of service use by the Customer under hazardous conditions.

- (A) The Customer will exercise all reasonable care to prevent loss or damage to Company property installed on the Customer's site for the purpose of supplying service to the Customer. The Customer is responsible for payment for loss or damage to Company property on the Customer's site arising from neglect, carelessness, or misuse, and will reimburse Company for the cost of necessary repairs or replacements.
- (B) The Customer is responsible for payment of any equipment damage or estimated unmetered usage resulting from unauthorized breaking of seals, interfering with, tampering with, or by-passing the Meter.
- (C) The Customer is responsible for notifying APS of any failure in Company's equipment.



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12.3 Removal of Facilities - Upon termination of service, Company may, without liability for injury or damage, dismantle and remove its facilities, installed for the purpose of supplying service to the Customer, and Company will have no further obligation to serve the Customer.

13. Successors and Assigns - Agreements for Service are binding on and for the benefit of the successors and assigns of the Customer and Company, but no assignments by the Customer are effective until the Customer's assignee agrees in writing to be bound and until the assignment is accepted in writing by Company.

14. Warranty - There are no understanding, agreements, representations, or warranties, expressed or implied (including warranties regarding merchantability or fitness for a particular purpose), not specified here or in the applicable rules of the Arizona Corporation Commission concerning the sale and delivery of services by Company to the Customer. These Terms and Conditions and the applicable rules of the Arizona Corporation Commission state the entire obligation of Company in connection with sales and deliveries.

15. Direct Access Service - *NOTE: Retail Electric Competition is currently on hold in APS Service Territory.*

15.1 Direct Access Service Request (DASR) - A Direct Access Service Request charge of \$10.00 plus any applicable adjustments will be assessed to the Electric Service Provider (ESP) submitting the DASR each time Company processes a Request (RQ) type DASR as specified in Company's Schedule 10, Terms and Conditions for Direct Access.

15.2 Direct Access Service - Direct Access Service will be effective upon the next Meter read date if DASR is processed 15 calendar days before that read date and the appropriate metering equipment is in place. If a DASR is made less than 15 calendar days before the next regular read date, the effective date will be at the next Meter read date. The above timeframes are applicable for Customers changing their selection of ESP or for Customers returning to Standard Offer service.

(A) Any Customer that selects Direct Access service may return to Standard Offer service in accordance with the rules, regulations, and orders of the Arizona Corporation Commission. The Customer will not be eligible for Direct Access service for the succeeding 12 months.

(B) If a Customer returning to Standard Offer, in accordance with the rules, regulations and orders of the Commission, was not given the required notification in accordance with the rules and regulations of the Commission by their Load Serving ESP of its intent to cease providing competitive services



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TERMS AND CONDITIONS FOR
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then the above provision will apply only if the Customer fails to select another ESP within 60 days of returning to Standard Offer service.

- (C) Unpaid charges incurred before the Customer selects Direct Access will not delay the Customer's request for Direct Access. These charges remain the responsibility of the Customer to pay. Normal collection activity, including discontinuing service, may result from failure to pay.
- (D) Where the ESP is the MSP or MRSP, and the ESP or its' agent fails to provide the Meter data to Company under Company's Schedule 10 Section 8.16, Meter Reading Data Obligations, Company may, at its option, obtain the data or estimate the billing determinants.
- (E) Where Company is the MRSP, Company will, at the request of the Customer or the ESP, reread or test the Customer's Meter within 10 working days after the request. The cost of each reread or test may be applied to the Customer or ESP when applicable.
- (F) All energy sold to the Customer by MRSP will be measured by commercially acceptable measuring devices and under the terms and conditions of Company's Schedule 10 - Terms and Conditions for Direct Access.

15.3 Direct Access Deposits - If the Customer chooses to change from Standard Offer to Direct Access services, the deposit may be decreased by an amount that reflects the portion of the Customer's service being provided by a Load Serving ESP. If the Load Serving ESP is providing ESP Consolidated Billing under Company's Schedule 10 Section 7, the entire deposit will be credited to the Customer's account; or, if the Customer chooses to change from Direct Access to Standard Offer service, the requested deposit amount may be increased by an amount under Section 3.3 which reflects that Company is providing bundled electric service.

15.4 Direct Access and Company Equipment

- (A) **Meters** - A Meter Service Provider (MSP) or its authorized agents may remove Company's metering equipment under Company's Schedule 10 Terms and Conditions for Direct Access. Meters not returned to Company or returned damaged will result in charge to the MSP of the replacement costs, plus an administration fee of 15%, less five year's depreciation.
- (B) **Lock-rings** - Company will lease lock-ring keys to MSP's or their agents who are authorized to remove Company Meters under the terms and conditions of Company's Schedule 10 at a refundable charge of \$70.00 plus applicable adjustments per key. The charge will not be refunded if a key is lost, stolen, or damaged. If Company must replace 10% of the issued keys within any 12 month period because of loss by the MSP's agent, Company may, rather than leasing additional lock ring keys, require the MSP to arrange for a joint



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meeting. All lock-ring keys must be returned to Company within five working days if the MSP or its authorized agents are:

No longer permitted to remove Company Meters under the conditions of Company's Schedule 10;

(1) No longer authorized by the Arizona Corporation Commission to provide services; or

(2) The ESP Agreement has been terminated.

- (C) **Site Meetings** - If the MSP, the Customer, or the Customer's agent requests a joint site meeting for removal of Company metering and associated equipment or lock ring, a base charge of \$62.00 plus applicable adjustments per site will be assessed. Company may assess an additional charge of \$53.00 plus applicable adjustments per hour for joint site meetings that exceed 30 minutes. If Company must temporarily replace the MSP's Meter or associated metering equipment during emergency situations or to restore power to a Customer, the above charges may apply.

DEFINITIONS

Applicant means a person requesting the utility to supply electric service. [A.A.C. R14-2-201-(2)]

Application means a request to the utility for electric service, as distinguished from an inquiry as to the availability or charges for such service. [A.A.C. R14-2-201-(3)]

Billing Month means the period between any two regular readings of the utility's Meters at approximately 30 day intervals. [A.A.C. R14-2-201-(5)]

Billing Period means the time interval between two consecutive Meter readings that are taken for billing purposes. [A.A.C. R14-2-201-(6)]

Company holidays (as referred to in section 2.4) are New Year's Day, Martin Luther King Jr. Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, the day after Thanksgiving, and Christmas Day.

Customer means the person or entity in whose name service is rendered, as evidenced by the signature on the Application or contract for that service, or by the receipt and/or payment of bills regularly issued in his name regardless of the identity of the actual user of the service. [A.A.C. R14-2-201-(9)]

ARIZONA PUBLIC SERVICE COMPANY
Phoenix, Arizona
Filed by: Charles A. Miessner
Title: Manager, Regulation and Pricing
Original Effective Date: December 1951

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Delinquent Bill means a bill in which current electric charges are considered past due (15 calendar days after the statement date).

Demand means the rate at which power is delivered during any specified period of time. Demand may be expressed in kilowatts, kilovolt-amperes, or other suitable units. [A.A.C. R14-2-201-(12)]

Distribution Lines means the utility lines operated at distribution voltages which are constructed along public roadways or other bona fide rights-of-way, including Easements on Customer's property. [A.A.C. R-14-2-201-(13)]

Easement means a property owner ("Grantor") grants the right to use the owner's land to another party. An easement gives Company the right to have Company lines on property not owned by the Company. This allows Company to build, replace, repair, operate and maintain electrical equipment for the safe transmission and distribution of electricity. The Grantor may continue to use the land along the easement within certain limitations.

Landlord Automatic Transfer of Service Agreement is a legal contract established between the customer ("Landlord") and Company, that provides continuous and uninterrupted service to the Landlord during intervals when a Landlord has no tenants. A Service Establishment Charge will not apply and service will automatically be transferred into the Landlord's name. Landlord Automatic Transfer of Service Agreements are available to property owners that have established credit with Company.

Master meter means a meter used for measuring or recording the flow of electricity that has passed through it at a single location where said electricity is distributed to tenants or occupants for their individual usage. [A.A.C. R14-2-201(23)]

Meter means the instrument used for measuring and indicating or recording the flow of electricity that has passed through it. [A.A.C. R14-2-201(25)]

Meter tampering means a situation where a meter has been altered or bypassed without prior written authorization from Company. Common examples are meter bypassing, use of magnets to slow the meter recording, and broken meter seals. [A.A.C. R14-2-201(26)]

Minimum charge means the amount the customer must pay for the availability of electric service, including an amount of usage, as specified in the utility's tariffs. [A.A.C. R14-2-201(27)]

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Point of delivery or delivery point means the point where facilities owned, leased, or under license by a customer connects to the utility's facilities. [A.A.C. R14-2-201(31)]

Tariffs mean the documents filed with the Arizona Corporation Commission which list the services and products offered by the utility and which set forth the terms and conditions and a schedule of the rates and charges, for those services and products. [A.A.C. R14-2-201(42)]

Statement of Charges		
Description	Charge	Reference
Residential Service Establishment Charge	\$8.00	2
Nonresidential Service Establishment Charge	\$33.00	2
After hours Charge –Residential Standard Metering	\$8.00	2.2
After hours Charge –Residential Non-Standard Metering	\$137.00	2.2
After hours Charge –Nonresidential	\$164.00	2.2
Same Day Connect Charge	\$87.00	2.3
Non-Standard Service Request Charge (per crew person, per hour)	\$164.00	2.4
Electronically Transmitted Payment Discount	-\$0.48	5.3
Dishonored Payment Fee	\$15.00	6.4
Field Call Charge	\$10.00	7.6
Overhead Reconnection Charge	\$89.00	7.6
Underground Reconnection Charge	\$135.00	7.6
Non-Standard Metering- Monthly Meter Reading	\$5.00	8.4
Non-Standard Metering Set-up fee for customer with existing AMI meter	\$50.00	8.4
Meter Reread	\$14.00	8.7
Meter test in shop	\$44.00	8.9
Meter test at site	\$93.00	8.9

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Trip Charge - Residential	\$22.00	10.5
Trip Charge - Nonresidential	\$26.00	10.5

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DOCKET NOS. E-01345A-16-0036 ET AL.



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COMMISSIONERS
BOB STUMP - Chairman
GARY PIERCE
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EXHIBIT B



ARIZONA CORPORATION COMMISSION

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Arizona Corporation Commission

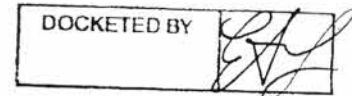
DOCKETED

NOV 04 2014

To: Docket Control

From: Jodi Jerich, Executive Director

Date: November 4, 2014



Re: **Docket No: E-00000C-11-0328, the Generic Docket
for the Commission's Inquiry Into Smart Meters**

ORIGINAL

At the August 5, 2013 Commission Staff Open Meeting, the Commission voted to request the Arizona Department of Health Services to conduct a study on the potential health effects of exposure to radio frequencies emitted from Smart Meters and to docket its report in Docket No. E-00000C-11-0328. I have received that report.

Please docket the attached "Public Health Evaluation of Radio Frequency Exposure from Electronic Meters" authored by the Arizona Department of Health, Office of Environmental Health.

RECEIVED
AZ CORP COMMISSION
DOCKET CONTROL
2014 NOV 4 AM 10:05

An original and thirteen (13) copies were docketed with Docket Control with copies mailed to the Service List (Attached).

DOCKET NOS. E-01345A-16-0036 ET AL.

November 4, 2014
Page 2

Copy of the foregoing mailed this
4th day of November, 2014 to:

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Public Health Evaluation of Radio Frequency Exposure from Electronic Meters

October 31, 2014

Office of Environmental Health

Arizona
Department of
Health Services

DECISION NO. 76374

Introduction

A "smart meter" is a term that typically refers to electronic meters that have a two-way communication function between the utility company and the customer. Arizona citizens have been concerned about the potential health effects from exposure to radiofrequency (RF) emitted from Smart Meters. In order to address the customer concerns, the Arizona Corporation Commission (ACC) has requested a review of smart meters used in Arizona. This review is to include a survey of meters used in Arizona to determine whether they emit RF within the Federal Communications Commission (FCC) guidelines, and an evaluation on the potential health risks of RF radiation from the smart meters. In Arizona, there are multiple metering technologies used, and not all types will have and/or utilize the two-way communication function. For the purpose of this report, Arizona Department of Health Services (ADHS) will refer to all wireless communicating meters as electronic meters, regardless of the communication function. The ACC provided comments on the goals and scope of this project, but relied on ADHS and the Arizona Radiation Regulatory Agency (ARRA) for their areas of expertise. The Environmental Toxicology Program in the Office of Environmental Health at the Arizona Department of Health Services conducts risk assessments to determine potential public health impact from site-related contamination. At the request of other agencies or the public, the Environmental Toxicology Program reviews available environmental and exposure data to evaluate potential community exposures to hazardous substances. ADHS does not collect new environmental data, but instead, relies on other agencies or third parties to collect the data.

ARRA houses the nonionizing radiation section, which enforces Arizona Administrative Code Title 12 Chapter 1, Article 14 "The Control of Nonionizing Radiation." These rules address sources of radiofrequency radiation (RF) in the environment, occupational exposure concerns, as well as public exposure. ARRA regulates Class 3B and Class 4 lasers used in the medical, industrial and light show fields, Ultraviolet radiation in tanning facilities, RF radiation sources such as heat sealers and industrial oven, RF radiation in the industrial environment within a frequency range of 0.3 megahertz (MHz) to 100 gigahertz (GHz), and communication sources through a registration/license program. ARRA does not have regulatory authority to enforce rules regarding electronic meters. However, they have the expertise, experience, and ability to measure RF emitting devices including electronic meters.

The goals of this report are 1) to determine whether RF exposure from electronic meters on residences, including single family homes and apartment complexes are within the FCC standards or are at levels to cause public health concern; and 2) to determine whether the current body of peer-reviewed literature has found an association between RF exposure from low level RF exposure and adverse health effects. ADHS reviewed available peer-reviewed literature to summarize potential health effects from radio frequency exposure, including exposure from electronic meters. ADHS also conducted a literature review of standards and guidelines for RF radiation used by a number of countries and health organizations and reviewed the personal anecdotes and journal articles submitted by concerned citizens. Finally, ADHS reviewed RF data collected from various meter types in Arizona to determine if the measured radio frequency is a public health concern.

Background:

What is EMF/RF?

Electromagnetic field (EMF) radiation consists of waves of electric and magnetic energy moving together through space at the speed of light (FCC 2012). Radio waves and microwaves, emitted by transmitting antennas, are one form of electromagnetic radiation and are collectively referred to as “radiofrequency” or “RF” energy or radiation. The most important use for RF energy is in providing telecommunications services. Smart meters, cell phones, Wi-Fi routers, computers, and radio and television broadcasting are just a few of the many telecommunications applications of RF energy.

How is radio frequency measured?

Radiofrequency has two components: an electric and magnetic component. A common unit for characterizing the total electromagnetic field is “power density,” which is defined as power per unit area. It is commonly expressed in terms of watts per square meter (W/m^2) (FCC 2012). The quantity used to measure the rate at which RF energy is actually absorbed in a body is called the “Specific Absorption Rate” or “SAR,” which is usually expressed in units of watts per kilogram (W/kg). In the case of exposure of the whole body, an adult absorbs RF energy at a maximum rate when the frequency of the RF radiation is approximately 70 MHz. Because of this “resonance phenomenon,” RF safety standards are generally most restrictive in the frequency range of 30-300 MHz (FCC 2012).

How do electronic meters use radio frequency?

This report focuses on the usage of electronic meters. Electronic meters give utilities a means to match energy consumption with energy generation, and allow consumers to better manage their energy use. Four general types of meters are used in Arizona. The oldest meter type is analog, which displays energy usage on dials on the face of the meter. Power Line Carriers (PLCs) communicate with the electric company by using power lines, and do not use RF frequencies for communication. Automated Meter Reading (AMR) meters are one-way communicating meters that use RF frequencies to communicate usage data to the electric companies. Advanced Metering Infrastructure (AMI) meters are devices capable of two-way communication, and use RF frequencies for communication purposes. AMI meters send usage data to the electric company, and the electric companies can communicate with the meter, for example, starting and stopping service remotely.

Table 1. Metering technologies evaluated in this study

Type of Meter	Description	Frequency
Analog	The most common type of analog meter is essentially an electric induction motor that drives a series of geared wheels connected to indicators on the meter’s face. The utility sends meter readers periodically to each meter, and no RF frequency is used.	N/A
Power Line Carrier (PLC)	Power-line communications usually operate by adding a modulated carrier signal to the existing home electrical wiring system. A PLC carries data on a conductor that is also used simultaneously for alternating current (AC) electric power	57-63 Hz

One-way Communicating [Electronic Meter]	transmission or distribution to consumers. Known as Automated Meter Reading (AMR), these systems consist of small, low-power radio transmitters connected to individual meters that send daily readings to a network of receivers (NYC 2014).	902 – 928 MHz
Two-way Communicating [Electronic Meter] [Smart Meter]	Known as Advanced Metering Infrastructure (AMI), the meters record consumption of electric energy in intervals of an hour or less and communicate that information at least daily back to the utility for monitoring and billing purposes.	902 – 928 MHz

What are some other ways the public might come into contact with radio frequency on a daily basis?

Radio frequency can be from natural sources (e.g. the sun) or from man-made sources (e.g. radios). Some common household items use RF and are regulated by the FCC. The radio frequency ranges emitted from some of the most common RF sources are presented in the diagram below:

Electromagnetic Spectrum

Frequency (Hz)

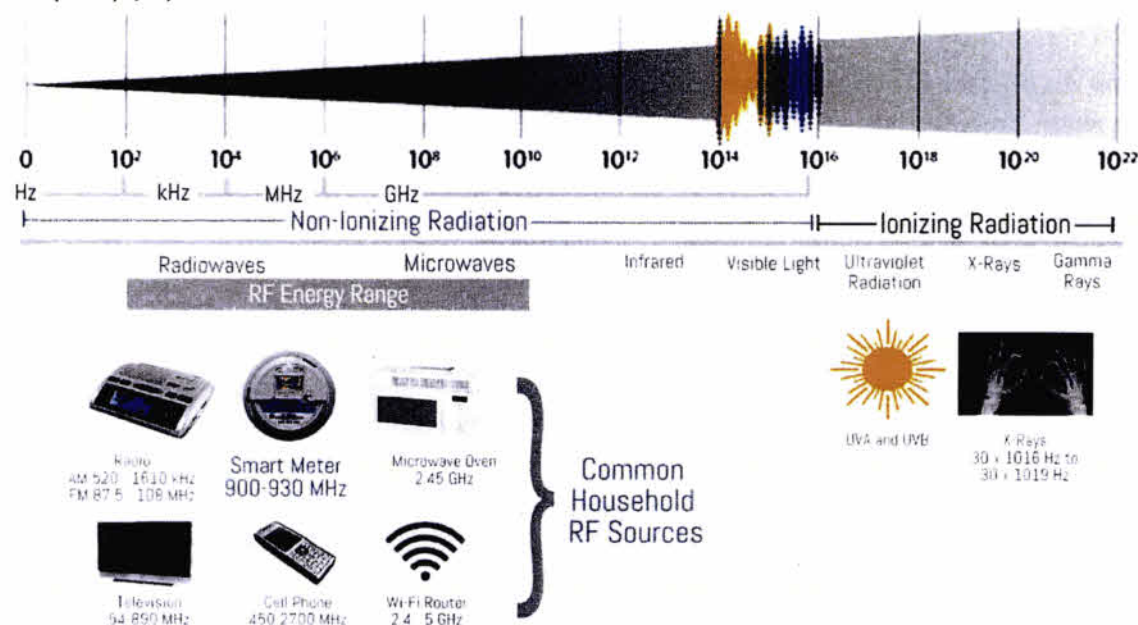


Figure 1. Electromagnetic Spectrum and RF Sources

*Adapted from the National Institute of Environmental Health Sciences [Electromagnetic Spectrum](#)

What regulations have been developed to limit RF exposure?

The strength of RF exposure from a source can depend on a number of factors. Some of these are discussed below:

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- **Power Density:** Some devices emit radiation at higher power densities than others. For example, cell phones and microwave ovens emit radiation at higher power densities than Wi-Fi routers, radios, and smart meters.
- **Distance from radiation signal:** RF exposure decreases rapidly with distance. For the example of microwave ovens, a person 50 cm from a microwave oven receives about 1/100th of the microwave exposure of a person 5 cm away. (WHO 2005)
- **Duration of signal:** Americans spend on average nearly 3 hours per day on their mobile device per day. (Geekwire 2014) In contrast, smart meters in Arizona typically emit RF less than 1/2 hour in total during the day.
- **Attenuation factors:** Attenuation is simply a reduction of signal strength during transmission. Walls, doors, elevator shafts, people, and other obstacles offer varying degrees of attenuation (Moonblink 2014).
- **RF from the Sun:** Humans can also receive RF radiation from the sun. However, this radiation is at a different frequency from radio waves and microwaves.

What are some potential health effects from radio frequency?

Biological effects can result from exposure to RF energy. Exposure to very high RF power densities can result in the heating of biological tissue and an increase in body temperature as a result of thermal radiation (thermal health effects). This can lead to tissue damage, particularly in the eyes and testes (FCC 2012). At relatively low levels of exposure to RF radiation, the evidence for production of adverse health effects is unproven, but there has been concern over non-thermal health effects. A number of individuals have reported a variety of health problems that they relate to exposure to EMF. Some report being so severely affected that they cease work and change their entire lifestyle. This reported sensitivity to EMF has been generally termed “electromagnetic hypersensitivity” or EHS. A survey of occupational medical centers estimated the prevalence of EHS to be a few individuals per million in the population (WHO 2005).

Part 1: Review of Radio Frequency Regulations and Literature**US Regulatory Standard**

ADHS searched for regulatory standards developed and/or adopted by the United States Federal Communications Commission (FCC). The Federal Communications Commission (FCC) is an independent agency of the United States government that regulates interstate communications by radio, television, wire, satellite, and cable in the US.

The current exposure limit (Table 2) was determined based on the recommendation made by the International Commission on Non-Ionizing Radiation Protection and the Institute of Electrical and Electronics Engineers, Inc. (IEEE). The ICNIRP and IEEE determined the exposure limits (for occupational and for the general public/community) based on the lowest RF exposure that can cause biological effects. A safety factor was used to derive the values for Maximum Permissible Exposure (MPE) for electric and magnetic field strength and power density. The FCC adopted these values in 1996.

The time-averaging concept can be used to determine the levels of exposure. This means that it is acceptable to exceed the recommended limits for short periods of time as long as the average exposure does not exceed the limit.

Guidelines are more restrictive for lower radio frequencies. Since the smart meters of interest operate between frequencies of 900 and 930MHz, all of the guidelines for power densities presented in Table 2 were calculated assuming a frequency of 900MHz to be most conservative. All standards referenced in this report are based on community exposure, which considered sensitive populations, including children and the elderly. For a discussion of the inclusion of non-thermal effects, see this statement made by the Institute of Electrical and Electronics Engineers (IEEE):

“Some investigators have reported effects at much lower exposure levels, which are sometimes called ‘non-thermal’ effects. Each version of the IEEE standard has acknowledged the existence of such reports, while at the same time indicating that they were insufficient to be considered a health hazard or to be used as a basis to develop exposure guidelines. For example, the 1991 standard states that ‘research on the effects of chronic exposure and speculations on the biological significance of non-thermal interactions have not yet resulted in any meaningful basis for alteration of the standard. It remains to be seen what future research may produce for consideration at the time of the next revision of this standard.’ Other organizations have independently reached this same conclusion” (Ziskin 2005).

Review of Other Standards and Recommendations

ADHS directed a review of standards and guidelines for RF radiation used by a number of countries and health organizations. ADHS found standards for Australia, Canada, ICNIRP, IEEE, New Zealand, and Russia which also included a discussion of how they arrived at their standard.

In North America and most of Europe, exposure standards and guidelines have been based on exposure levels where harmful effects to humans occur. FCC safety factors are then incorporated to determine specific levels of exposure aimed to provide sufficient protection for various segments of the population (including children, the elderly, etc.). Some published limits in other countries have been more restrictive than existing or proposed recommendations for exposure developed in North America and other parts of Europe.

The FCC (USA), Canada, Australia, and New Zealand all based their guidelines on the recommendations of the International Commission on Non-Ionizing Radiation Protection (ICNIRP)’s guideline. The main reason for slight differences in guidelines between these countries is for differences in the safety factors used.

Table 2. Standards and Recommended Guidelines for 900 MHz Radio Frequency		
Country/Organization	Standard/Guideline for Power Density	Citation
Federal Communications Commission (FCC, USA)	6 W/m ² (Watts/square meter)	OET Bulletin 56: Fourth Edition, August 1999 ¹
Australia	9 W/m ²	Radiation Protection Standard, May 2002 ²
Canada	4.5 W/m ²	Safety Code 6, 2009 ³
International Commission on Non-Ionizing Radiation Protection (ICNIRP)	4.5 W/m ²	ICNIRP Guidelines for Limiting Exposure..., 1998 ⁴
Institute of Electrical and Electronics Engineers (IEEE)	4.5 W/m ²	IEEE Exposure Limits..., 2005 ⁵
New Zealand	0.5 W/m ²	Radiofrequency Fields Exposure Standard, Feb. 2014 ⁶
Russia	0.1 W/m ²	Scientific basis for Soviet and Russian Radiofrequency Standards..., July 2012 ⁷

Links: ¹FCC ²Australia ³Canada ⁴ICNIRP ⁵IEEE ⁶New Zealand ⁷Russia

International Commission on Non-Ionizing Radiation Protection (ICNIRP):

The ICNIRP is an independent non-profit scientific organization chartered in Germany, which specializes in non-ionizing radiation protection. Their guideline is based on the study: "Biological Effects and Health Hazards of RF and MW Energy: Fundamentals and Overall Phenomenology" by Sol M. Michaelson. Russia's guideline of 0.1 W/m² was based on the study: "Biological Significance of Autoimmune Reactions of the Organism After Exposure to Environmental Factors" by G. I. Vinogradov (in Russian).

This study reviewed a number of studies on animals, including rats and rabbits. It was found from this animal data that exposure to more intense fields, producing Specific Absorption Rate (SAR) values in excess of 4 W/kg, can overwhelm the thermoregulatory capacity of the body and produce harmful levels of tissue heating. The sensitivity of various types of tissue to thermal damage varies widely, but the threshold for irreversible effects in even the most sensitive tissues is greater than 4 W/kg under normal environmental conditions. These data form the basis for an occupational exposure restriction of 0.4 W/kg and a community exposure restriction of 0.08 W/kg, which provide a large margin of safety for other limiting conditions such as high ambient temperature, humidity, or level of physical activity (ICNIRP 1998). These values can then be converted from SAR to their equivalent power density.

The Institute of Electrical and Electronics Engineers (IEEE):

The Institute of Electrical and Electronics Engineers (IEEE) is a professional association, whose objectives are the educational and technical advancement of electrical and electronic

engineering, telecommunications, computer engineering, and allied disciplines. The guideline determined by IEEE has a similar rationale to that of ICNIRP, but was developed using different processes. Based on its review, IEEE concluded that disruption of food-motivated learned behavior in laboratory animals is the most sensitive biological response that is both well confirmed and predictive of hazard. This effect, known as behavioral disruption, has been observed in laboratory animals ranging from rodents to monkeys exposed to RF fields at frequencies ranging from 225 MHz to 5.8 GHz. Depending on the animal species and RF frequency, the exposure needed to produce behavioral disruption varied from 3.2 to 8 W/kg (Ziskin 2005).

From its literature review, IEEE chose a value of 4 W/kg for the whole body averaged SAR as the threshold for behavioral disruption in animals. It reduced this SAR by a factor of 10 to establish the basic restriction for exposure in controlled environments, and then added another factor of 5 for exposure in uncontrolled environments. The resulting basic restrictions on whole body SAR are 0.4 W/kg for controlled environments, and 0.08 W/kg for uncontrolled environments. These values can then be converted from SAR to their equivalent power density. For 900 MHz radio frequency, the equivalent power density is 4.5 W/m².

Russia:

Radiofrequency (RF) standards for both public and occupational health issued by the Russian Federation have always contained exposure limits that were below those in other countries. Their guideline of 0.1 W/m² was based on the study: Vinogradov GI, Naumenko GM, Vinarskaya EM, Gonchar NM. 1987. Biological significance of autoimmune reactions of the organism after exposure to environmental factors. Gig Sanit 1:55-58 (in Russian).

This study reviewed a number of studies on animals, including rabbits, guinea pigs, white rats, wistar rats, and female fisher rats. Based on the immunology studies discussed in the article, chronic daily exposure to 1-5 W/m² can induce persistent pathological reactions. The threshold exposure for the unfavorable biological effects (0.5 W/m²) was found in the immunology studies, but these effects were not pathological since the organisms could compensate for the exposure. The authors concluded, however, continual compensation could lead to long-term adverse effects and thus should be protected against. Chronic exposure to 0.1-0.2 W/m² did not induce any noticeable biological changes in small laboratory animals. Therefore the guideline in Russia is 0.1 W/m².

Other States' Reviews

Four other states have also conducted various types of studies to evaluate the potential health risk from exposure to radio frequency from electronic meters: Texas, California, Vermont, and Maine. ADHS reviewed those studies and some of the literature referenced in those studies. The Vermont study discussed sampling of electronic meters and identified methods that yielded "worst-case" scenarios. The "worst-case" scenarios identified in Vermont's study were as a starting point for a streamlined sampling approach. More on this is described in the methods of the field study section of this report. ADHS also researched whether any of these states

recommended a more stringent RF standard be applied to electronic meters for the protection of public health.

ADHS reviewed similar assessments performed by other US states and organizations on the potential health effects of RF radiation. Their methods and conclusions are discussed below:

California: In 2010, the California Council on Science and Technology (CCST) performed an “independent, science-based study that would help policy makers and the general public resolve the debate over whether smart meters present a significant risk of adverse health effects.” They identified and reviewed over 100 publications and postings about smart meters and other devices in the same range of emissions, including research related to cell phone RF emissions. In addition, they contacted over two dozen experts in radio and electromagnetic emissions and related fields and asked for their opinions. They concluded that:

1. The FCC standard provides an adequate factor of safety against known RF induced health impacts of smart meters and other electronic devices in the same range of RF emissions.
2. At this time, there is no clear evidence that additional standards are needed to protect the public from smart meters or other common household electronic devices (CCST 2010).

Texas: In 2012, the Public Utility Commission of Texas wrote a survey report of the existing scientific research and analyses that have been performed to investigate the potential health effects of exposure to low-level radio frequency electromagnetic fields emitted by wireless communication devices including smart meters. They concluded that:

1. * Decades of scientific research have not provided any proven or unambiguous biological effects from exposure to low-level radio frequency signals. All available material was reviewed, and no credible evidence to suggest that smart meters emit harmful amount of EMF radiation was found.
2. Smart meters do not emit or utilize ionizing radiation.
3. Smart meters are not intended for, are not designed to, and do not have the capability to harm an individual or direct a person’s thoughts or actions (Rivaldo 2012).

Maine:

- A. In 2010, a complaint was filed with the Maine Public Utilities Commission focusing on concerns related to health, safety, and security of smart meters. In response, Maine Center for Disease Control and Prevention (CDC) assembled a “smart meters team” to review numerous materials written by the WHO, FCC, NIH, Health Canada, ICNIRP, IEEE and other government agencies and academic organizations. With regards to electromagnetic hypersensitivity (EHS), the smart meters team concluded that the majority of studies indicate that EHS individuals cannot detect EMF exposure any more accurately than non-EHS individuals, and that well controlled and conducted double-blind studies have shown that symptoms were not correlated with EMF exposure. In summary, they concluded that:

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1. Agency assessments and studies do not indicate any consistent or convincing evidence to support a concern for health effects related to the use of radiofrequency in the range of frequencies and power used by smart meters.
 2. They also do not indicate an association of EMF exposure and symptoms that have been described as electromagnetic sensitivity (Ball 2010).
- B. In 2013, True North Associates was retained by the Office of the Maine Public Advocate to “measure the maximum and average power output of a sample of smart meters and other system components using the mesh network, and compare these readings to existing safety standards.” True North focused its efforts on a selection of the most active meters and elements within the mesh network and included all system components involved in broadcasting data within the network. Three residential meter locations were tested. The results obtained through the effort indicated that the measured exposure levels were well below current FCC exposure limits” (C2 Systems 2013).

Vermont:

- A. In 2012, the Vermont Department of Health measured RF from smart meters. They stated, “The readings from these devices verify that they emit no more than a small fraction of the RF emitted from a wireless phone, even at very close proximity to the meter, and are well below regulatory limits set by the Federal Communications Commission (FCC). After extensive review of the scientific literature available to date and current FCC regulatory health protection standards, we agree with the opinion of experts:
1. The thermal health effects of RFR are well understood, and are the current basis for regulatory exposure limits. These limits are sufficient to prevent thermal health effects.
 2. Non-thermal health effects have been widely studied, but are still theoretical and have not been recognized by experts as a basis for changing regulatory exposure limits” (Vermont 2012)
- B. In 2012, the Vermont Department of Public Service aimed to assess compliance of smart meter signal intensities with regulations established by the FCC that prescribe limits for safe exposure to humans. In total, Vermont conducted measurements at 37 different locations in the state, including 18 residential sites, six banks of smart meters, two data collection points, one isolated meter, and 14 general environmental measurement sites. Field measurements were accomplished with a spectrum analyzer based selective radiation meter (Narda model SRM-3000), which permits direct measurement of the intensity of RF fields expressed as a percentage of the FCC maximum permissible exposure (MPE) values. Using the highest indicated results from the measurements performed in the study, it was concluded that:
1. Potential exposure of individuals to RF fields associated with currently deployed smart meters is small when compared to the limits set by the FCC.

2. Any potential exposure to the investigated smart meters will comply with the FCC exposure rules by a wide margin (Tell 2013).

Scientific Publication Review

Review Articles

ADHS performed a literature review of the potential health effects caused by exposure to RF radiation. ADHS searched two different literature databases of peer-reviewed articles. ADHS searched for review articles and articles that discussed an association between RF exposure and any of the top five health concerns from community members (see below). Preference was given to review articles that 1) discussed radiation from electronic meters, and 2) were published within the last 5 years if they could be found.

ADHS found that most experts agree that exposure to RF at high enough strengths for long enough time can result in adverse health outcomes from thermal effects. However, when discussing non-thermal adverse health outcomes, the literature is not clear.

Some study designs reported in the literature provide higher levels of evidence than others. For example, human epidemiology studies are of primary importance in health risk assessment because they can provide direct information on the health of people exposed to an agent. When examining human epidemiology data, systematic review articles which conduct meta-analyses (a statistical technique for combining the findings from independent studies) are the strongest literature. These studies aim for a complete coverage of all relevant studies. They look for the presence of differences, and explore the robustness of the main findings among peer-reviewed scientific studies.

Other literature ADHS reviewed discussed potential changes on the cellular level which provide knowledge of the basic interaction mechanisms of RF with cellular structures. These studies are important hypotheses generating studies. They provide evidence that RF may have the potential to affect human physiology. However, these studies cannot conclude that the cellular changes necessarily lead to disease. Other studies concluded exposure to RF from a variety of sources was associated with adverse health outcomes. However, these studies had several limitations ranging from recall bias to a lack of details, e.g. power densities of exposure or differentiating between exposure to electronic meters and other types of RF emitting devices. Sometimes a study that suggests an exposure is associated with an adverse health outcome is countered by another similar study that suggests there is no adverse health outcome at that exposure level.

ADHS considered articles' study design, exposure parameters, and relevance to this current review. The study design and exposure parameters vary widely from study to study. ADHS attempted to concentrate on those studies that addressed the questions relating to community exposure to RF from electronic meters.

It is generally well understood that RF exposure can cause tissue heating or “thermal effects,” leading to potential adverse health effects. More recently, concern has been raised that exposure to lower power densities of RF may lead to adverse health effects without tissue heating, also known as “non-thermal effects.” Several studies in the last decade have concluded that RF exposure at lower power densities than those required to cause thermal effects may cause adverse health effects including genotoxicity, decreased sperm count, headaches, sleep problems, concentration problems, and hyperactivity in children. The studies that draw these conclusions are largely based on exposure to cell phones and Wi-Fi devices held close to the human body such as a laptop on a man’s lap leading to decreased sperm quality/count. In addition, many of these conclusions were based on results that showed biologic changes. Biologic changes do not always lead to the expected adverse health outcome. The National Aeronautics and Space Administration (NASA) describes the difference of biologic and adverse effects as follows:

“Biological effect — A biological effect is an established effect caused by, or in response to, exposure to a biological, chemical, or physical agent, including electromagnetic energy. Biological effects are alterations of the structure, metabolism, or functions of a whole organism, its organs, tissues, and cells. Biological effects can occur without harming health and can be beneficial. Biological effects also can include sensation phenomena and adaptive responses.

Adverse health effect — A biological effect characterized by a harmful change in health.” (NASA, 2014)

For example Juutilainen, et. al. reviewed *in vitro*, *in vivo*, and human studies on a variety of adverse health outcomes. The authors stated, “the studies discussed in this review indicate that there may be specific effects from amplitude-modulated RF electromagnetic fields on the human central nervous system. The effects reported (changes in EEG, cerebral blood flow and performance in a memory test) are relatively minor, and do not at present allow conclusions concerning possible adverse health effects.” They went on to say:

“Further studies are warranted to determine how the effects depend on modulation characteristics and exposure level, and to investigate possible mechanisms and relevance to human health. Also, animal studies with suitable experimental models would be valuable to shed light on the mechanisms of the modulation-dependent effects on the central nervous system.

No consistent evidence has been found for modulation-dependent effects on carcinogenesis or genotoxicity. Some *in vitro* studies have provided suggestive evidence of modulation-specific effects at the cellular level. Follow-up of the positive findings would be helpful for

understanding the mechanisms of any specific effects of modulated RF energy.”

An international group of researchers reported in L. Verschaeve et. al. the endpoint, exposure conditions, and conclusions for 82 genotoxic endpoints from *in vitro* (lab studies, eg. cells in a petri dish), 29 animal, and 17 human from various studies on RF exposure. The authors concluded that the majority of studies that showed positive results (RF exposure lead to an adverse outcome) reported high exposure levels and the effects were likely due to thermal effects. They also stated that although there were some studies that suggested adverse outcomes from lower level exposure to RF, this apparent association might be due to many factors including poor study design, errors, or incorrect assumptions regarding exposure conditions. Their overall conclusion was “overall, taking into account these different factors the evidence to date that exposure to non-thermal levels of RFR is genotoxic is very weak.” The authors also stated, “the weight of scientific evidence from 45 peer reviewed investigations shows that RFR-exposure up to lifetime duration (2 years) does not adversely affect body mass, survival and carcinogenic processes (initiation, promotion or co-promotion) at whole-body dose rates up to 4W/kg and localized dose rates up to 2.3W/kg.

Kundi et al. (2010) reviewed nine epidemiological studies conducted by various countries: US, Sweden, Denmark, Finland, and Germany. These studies investigated the relationship between the use of cell phones and cancer, mainly brain tumors. They concluded that, based on the available information, an elevated cancer risk associated with cell phone use cannot be ruled out because increased cancer risks were observed in epidemiological studies. Yet, all studies have some methodological deficiencies: (1) short exposure duration: the duration of cell phone use were too short to be helpful in risk assessment, (2) exposure was not rigorously determined, and (3) there is a possibility of recall and response error (recall bias) in some studies. Recall bias occurs when the participants recall exposure differently. For example: cancer cases may try harder to recall prior exposure because they think the exposure might be related to their disease. Parents of children with birth effects may try harder to recall any drugs, exposures they had during pregnancy than parents of children without birth defects.

Roosli (2008) conducted a systemic review of electromagnetic sensibility (i.e. the ability to perceive low levels of EMF) and electromagnetic sensitivity (i.e. the development of health symptoms attributing to exposure to EMF such as headache, sleep disturbance, fatigue, dizziness, and concentration difficulties.) Meta-analytic techniques were used to analyze and integrate the information from peer-reviewed articles published before 2007. For electromagnetic sensibility, the author reviewed seven studies including a total of 182 self-declared electromagnetic hypersensitivity (EHS) individuals and 332 non-EHS individuals. The results indicated that there was no evidence that EHS individuals could detect presence or absence of EMF better than other persons. For electromagnetic sensitivity, the review from eight laboratory studies (including 194 EHS and 346 non-EHS individuals) showed that there was little evidence that short-term exposure to a mobile phone or based station causes non-specific symptoms. Four population-based studies were reviewed. Two studies observed slightly

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increased, but not significant, complaints while the other two studies found there is no association. Overall, this review concluded that: the large majority of individuals who claim to be able to detect low level of radio frequency EMF are not able to do so under double-blind conditions.

In another study, Karaca et. al. (2012) stated that "the results of our study support the proposition that cell phones may have a potential to cause hazardous effects on the genome; however, in *in vivo* conditions, the duration of exposure and the capacity of DNA repair may prevent the development of cancer to an extent."

Vigjyalaxmi compiled the conclusions on the biological effects of RF exposures from various national and international expert groups. Below is a summary table of these conclusions (2014).

Organization	Conclusions
IARC	No increased risk for meningioma and glioma with mobile phone use.
IEEE	Public health officials should continue to use RF safety limits of international organizations.
ICNIRP	Impossible to disprove non-thermal effects. Poor evidence for chronic/low-level effects. Studies with adequate RF exposure assessment did not reveal any health-related effects.
EU	No consistent evidence on cognitive function. No clear effect on neurological diseases. Inadequate evidence for cancer and neurological diseases.
Australia	No substantiated evidence for health risk for people living near base stations. Insufficient evidence for higher risk for children. No need to reconsider exposure limits.
Belgium	No proven health risks. Long-term health risks cannot be ruled out.
Canada	Cell phone towers are not dangerous. No evidence of adverse effects from WiFi.
Finland	Mobile phone use is not detrimental to health.
France	No new proven health effects.
Germany	Discrepancy between scientific evidence and risk perception. No overall risks. Risk perception is linked to media coverage.
Latin America	Insufficient evidence for adverse health effects from <i>in vitro</i> and <i>in vivo</i> studies.
Netherlands	Insufficient and inconsistent association of tumors in brain and other regions of head.
New Zealand	No health problems when complied with international guidelines.
Nordic Countries	No scientific evidence for adverse health effects.
Norway	No evidence that weak RF fields cause adverse health effects. Uncertainty in risk assessment is small.
Spain	No scientific evidence that exposure to low emissions levels produces adverse health effects in school children.
Sweden	Overall data do not support increased cancer risk in mobile phone users.
Switzerland	No new confirmed health effects.
Tanzania	No substantial evidence for harmful health effects. Many benefits of modern technology.
UK	No convincing evidence in adults or children for adverse effects below the

	recommended/guideline levels.
USA	Studies have not shown a consistent link with cancers of the brain, nerves, or other tissues of the head and neck cancers.

Source: Vijayalaxmi. "International and National Expert Group Evaluations: Biological/Health Effects of Radiofrequency Fields." International Journal of Environmental Research and Public Health: Volume 11, Issue 9. September 10, 2014.

Another review article summarizes that excessive exposure to magnetic fields from power lines and other sources of electric current increases the risk of development of some cancers and neurodegenerative diseases. Excessive exposure to RF radiation increases risk of cancer, male infertility, and neurobehavioral abnormalities. Smart meters usually produce atypical, relatively potent, and short-pulsed RF microwaves whose biological effects have never been fully tested and may, in fact, be more hazardous than other waveforms. Electronic meters can add significantly to aggregate RF exposure.

However, at further study of the article, the article states that a typical electronic meter with a 5% duty cycle at a distance of 20 cm (= 0.656 ft) emits $11 \mu\text{W}/\text{cm}^2$ of RF radiation. This is equal to $0.11 \text{ W}/\text{m}^2$, which is well below the FCC community guideline of $6 \text{ W}/\text{m}^2$. The article seems more focused on the dangers of cell phone radiation, which is a separate issue (Carpenter, 2013).

Whether a person experiences an adverse health outcome from RF depends on many factors. Factors include how strong the power density is, how far the person is from the RF field, how often the person is exposed, and the individual health of the person exposed.

Individual Health Effects

ADHS conducted a literature search of peer-reviewed articles on the potential effects of RF radiation. Special attention was given to articles that discussed the health concerns most noted by Arizona citizens. These health effects are: headaches, insomnia, cancer, ear pain/tinnitus, and fatigue. Preference was given to articles that 1) discussed radiation from electronic meters, and 2) were published within the last 5 years.

The articles ADHS found discussed RF from sources other than electronic meters. A number of the articles discussed the potential health effects listed above from RF radiation emitted from cell phones. Electronic meters use a very similar wireless technology to cell phones, and the electronic meters in Arizona use a frequency of 900-930 MHz, which is within the frequency range of cell phones (450-2700 MHz). However, strength of the RF field and exposure to electronic meters and cell phones differ.

Most of the studies concluded that there was no association between RF exposure at low levels and adverse health outcomes. A couple of articles found weak associations. Some studies called for additional research (Mohler, 2012; Lowden 2011; Heinrich 2010; Mortazavi 2014; Poulsen 2013; Swerdlow 2011; Kwon 2012; Choi 2014; and Frei 2012).

Submissions from the Community

Arizona residents have submitted a plethora of information to the Arizona Corporation Commission's eDocket relating to RF exposures from electronic meters. ADHS reviewed the documents submitted from August 2011 to August 2014 that discussed health-related concerns. ADHS also reviewed direct communication received before October 1, 2014 from community members across the state. The types of information submitted by residents included news articles, websites, peer-reviewed studies, documents released by governmental regulatory or advisory bodies, anecdotal descriptions of how residents believed electronic meters were affecting their health, and personal opinions. ADHS reviewed the peer-reviewed studies and government documents. A discussion on some of these is included in the literature review section described above. ADHS created a table of the reported health effects, and made note of how many times each effect was mentioned. ADHS determined the top 5 mentioned health effects and searched peer-reviewed literature databases (described above) for peer-reviewed studies that looked for associations between RF exposure and the reported health effect. A list of the reported health concerns can be found in Appendix A.

ADHS reviewed all 38 journal articles assessing health implications that were submitted to the ACC's eDocket. ADHS provides a summary and response to the three were most often mentioned articles in Appendix B.

Health Concerns Mentioned in Submissions to the ACC eDocket		Number of times mentioned
Top Five Concerns	Headaches	28
	Insomnia	27
	Cancer	15
	Fatigue	14
	Ear pain/ringing (tinnitus)	14

Part 2: Field Study

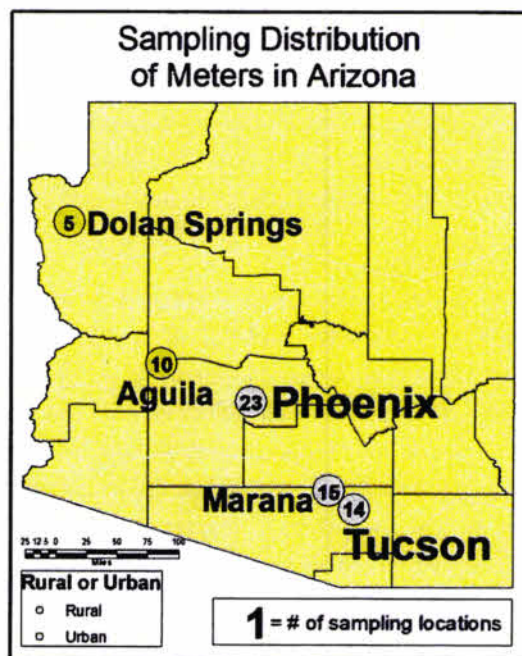
ADHS worked with ARRA to design a field sampling plan that would measure different meter technologies in urban and rural areas. The agencies used their expertise and referred to previous studies to identify a scientifically sound method. The agencies approached the field study by attempting to capture a worst case scenario as a screening process. If a measurement was captured at or above the screening value, a more in depth evaluation would be necessary. The field study was not intended to strictly follow FCC's recommendations for evaluating human exposures to RF, but rather capture the worst case scenario. The FCC guidelines consider percent Maximum Permissible Exposure (MPE) and duty cycle when comparing the measured RF exposure to the standard. This study measured peak and average power densities at 5, 10, and 15 minutes without regard to duty cycle.

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It was decided that ARRA would test the RF emitted from a variety of meter technologies: analog, PLC, AMR and AMI. The Arizona Radiation Regulatory Agency (ARRA) conducted the field sampling analyzed in this report. ADHS used the measured RF levels to determine if there is a public health concern associated with exposures to electronic meters in Arizona. Sampling was conducted from June to September 2014 by ARRA. Only outdoor sampling was conducted at residential locations for single-family homes and apartment complexes.

Selecting sampling locations

Sampling locations were selected by the technology of the meter used by the electric companies for the three technologies: AMI, AMR, and PLC. 2010 U.S. Census Bureau definitions were used to identify whether a city was considered urban or rural. Locations that were serviced by each the three technologies were randomly chosen to identify five zip codes for testing (3 urban zip codes and 2 rural zip codes). The following cities and zip codes were selected for field sampling: Phoenix (85023), Aguila (85320), Tucson (85712), Dolan Springs (86441), and Marana (85658). ADHS contacted the electric companies for the zip codes selected for field sampling. ADHS requested all addresses within the zip code that have the technology being sampled. This was to ensure the chosen sampling locations would be operating as regularly scheduled. ADHS randomly selected addresses on the lists provided by the electric companies to create a description of neighborhoods (street names and names of apartment complexes) for ARRA to sample. ARRA then selected addresses from the neighborhood descriptions provided by ADHS.



Number of samples

ACC and ARRA worked together to determine the scope of the sampling. ARRA tested as many sampling locations in each of the zip codes as was feasible for the scope of the project. There were a total of 66 sampling locations: 10 locations were apartments, 2 locations were part of duplexes, and 54 were single-family residences.

Radiofrequency Sampling Device

The Tenmars TM-195 is a radio frequency (RF) field strength meter. It is designed for measuring and monitoring RF electromagnetic field strength over the frequency range of 50 megahertz through 3.5 gigahertz. This meter self-calibrates at power up levels but has a functionality to be manually adjusted to detect more sensitive frequencies inside of multiple frequency fields. Field strength meters will display excessive values if hand-held or moved during measurements from electrostatic charges. To counter this, the TM-195 should be used on a tripod or held as steady as possible while avoiding speaking or moving during measurements. The electrical specifications are as follows:

Under the following conditions:

Ambient temperature $+23^{\circ}\text{C} \pm 3^{\circ}\text{C}$

Relative Humidity 25% - 75%

Frequency range 50 megahertz – 3.5 gigahertz

CW signal ($f > 50$ megahertz) 0.01V/m to 20.0 V/m

0.1 mA/m to 532.6 mA/m, 0.01W/m² to 106.94mW/m²

Dynamic range: Typically 75 dB

Absolute error at 1 V/m and 2.45GHz ± 1.0 dB

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Frequency response:

Sensor taking into account typical CAL factor

 $\pm 2.4\text{dB}$ (50 Mhz to 1.9 GHz) $\pm 1.0\text{ dB}$ (1.9 GHz to 3.5 GHz)Isotropy deviation: Typically $\pm 1.0\text{ dB}$ (f 2.45GHz)Overload limit: .042 mW/cm²Overload limit: (0 to 50°C); $\pm .2\text{ dB}$

The Arizona Radiation Regulatory Agency uses this meter during routine use to ensure that industrial registrants registered to operate radio frequency devices do not exceed the maximum permissible exposure (MPE) limits as defined in the Arizona Administrative Code Title 12, Chapter 1, Article 14. Calculations of the MPE are published in IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

Sampling Design

The measurements of RF can be affected by various factors: traffic on the meter network, proximity to other meters, background RF, direct sunlight, barriers between the meter and the RF sampling device/person. These factors were considered in the design of the sampling plan.

Trial Sampling Event

A trial sampling event was conducted at a residential, single-family home and an apartment complex to determine the feasibility of various sampling parameters. At this event, two distances (three feet and nine feet), use of attenuation and no attenuation, and time intervals (readings every 15 minutes for one hour) were considered. It was determined that spending one hour at each location would significantly limit the number of total sampling locations in the final review. In order to 1) sample more locations, 2) measure the same location multiple times at different times of the day, and 3) sample locations across the state, it was decided to adjust the sampling parameters to measure the maximum radiofrequency a person may be exposed to from the electric meter, the worst-case scenario.

Vermont's Study

Richard Tell Associates, Inc. conducted a field study of electronic meters deployed in Vermont. During this field study, they sampled a residential meter to assess the potential exposure and directionality to electronic meter RF fields at various distances, heights, and horizontal directions. Readings were taken at four distances between one foot and 10 feet, with the highest reading occurring at a distance of one foot. For height, the measurement at four feet above the ground (the height of the face of the meter) was the highest reading, suggesting that emissions are mainly directed horizontal to the meter. In the horizontal plane, the highest readings occurred at zero degrees, or forward from the face of the meter. Measurements were also taken inside the home to account for attenuation. Attenuation refers to the concept that RF exposure is less if there is a material between the RF emitting device and the person being exposed.

The findings of Vermont's report were considered in determining the parameters of the "worst case scenario": measurements at one foot, height of the face of the meter, and the sampling device probe aimed at the front of the face of the meter, without any attenuation.

Readings from the TM-195 were taken at five minute intervals, over a 15 minute period. Readings were also taken at three different times during the day to determine if there is any difference in RF transmission throughout the day. Background RF was also measured near sampling locations. This background location was chosen to have as little RF transmission signals as possible, such as being away from overhead power lines, street lights, houses, etc. Background measurements were taken for all sampling locations.

Field Measurements

ARRA completed all field sampling and recorded data on the sampling form created by ADHS see Appendix C. ARRA mutually agreed upon sampling protocols.

Sampling device setup

The TM-195 was secured to a tripod and adjusted to the same height as the center of the face of the meter. For single meters, the probe was directed at the center of the electric meter. For a bank of meters, the probe was directed toward the center of the bank of meters and raised to the height of the middle of the bank of meters. The sampling device was placed one foot away from the electric meter (s), perpendicular to the front face of the meter.



Figure 2. TM-195 placement at a single-family residence.

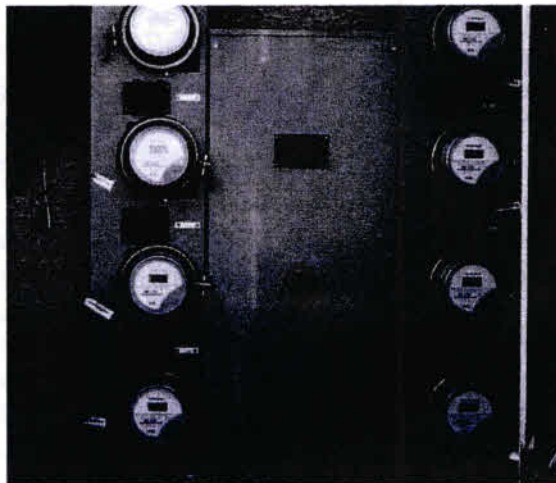


Figure 3. TM-195 placement at a bank of meters.

For each sampling location ARRA:

1. Recorded address location, address type (single family home or apartment complex), zip code (urban or rural area) and meter details [single meter or bank of meters (record number of meters in the bank)], location of meter(s) on the home (garage or living space) and the meter model.
2. Recorded background readings in the shade and sun to the corresponding sampling address location. Recorded average and peak reading over a five minute time interval.
3. Took all measurements at one foot, without attenuation.
4. Recorded the average and peak readings every five minutes for a total of 15 minutes.
5. Sampled at three different times during the day (for example, morning, midday, and afternoon).

For each reading time ARRA:

1. Recorded weather condition (sunny, partly cloudy, or mostly cloudy.)
2. Recorded whether or not the readings were taken in the shade.
3. Recorded dates and times of readings.

Results and discussion

On-site Readings of Radio Frequency Electromagnetic Fields

The RF electromagnetic field emissions associated with the usage of electronic, PLC, and analog meters were measured by using a RF field strength meter, Tenmars TM-195, as described in the Methods section. This field investigation examined the strengths (measured by power density in watts per square meter, W/m^2) of the RF fields emitted by different types of meters under normal operating conditions because the electric companies were not notified when the investigation was conducted. This was determined by the study group (i.e. ACC, ARRA, and ADHS) to prevent bias.

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The amount of transmitting activity of an electronic meter varies throughout the day. It depends on the prescribed data-collecting times and the interaction with other meters. In addition, the typical emission of an electronic meter consists of very brief spurts of pulses of RF energy lasting less than one-tenth of a second. To represent the overall exposure throughout a day, power density measurements were taken at three different times during the day (for example, morning, midday, and afternoon) for each sampling location. Both the average and instant peak values of field power density were measured. The measurements were taken at 1 foot away from the meter without attenuation. The measurements represented the maximum RF emission a person (i.e. worst case scenario) can be exposed to from the meters at the sampling time.

ADHS compared the levels of RF power density measured in front of different types of meters (Table 3). As expected the measured RF levels are higher for AMI and AMR meters because they communicate via radio frequency. ADHS compared the levels of RF power density measured in front of single and multiple meters (Table 4.) As expected the measured RF levels are higher for multiple meters. ADHS also compared the levels of RF power density measured at urban and rural areas (Table 5.) Overall, the RF levels are higher in urban area. These results indicated that, under the sampling scenario, people will receive higher levels of RF exposure from multiple meters. Yet, as discussed later, none of the measured RF power density are at levels of public health concern.

Table 3 shows the readings of power density from different types of meters.

Meter Type	Number of meters measured	Range of 5-min average (W/m ²)	Highest reading measured (W/m ²)
Analog	3	0.0000035 – 0.0000879	0.000129
PLC	13	0.0000131 – 0.0000936	0.001084
AMR	17	0.0000021 – 0.000747	0.001435
AMI	33	0.00001 – 0.0016017	0.0025

Table 4 shows the readings from residences with single meters or multiple meters.

Meter Type	Number of meters measured	Range of 5-min average (W/m ²)	Highest reading measured (W/m ²)
Single meter	54	0.000021 – 0.0003	0.0025
Multiple meters	12	0.00001347 – 0.0016017	0.0017679

Table 5 shows the readings from urban and rural areas.

Meter Type	Number of meters measured	Range of 5-min average (W/m ²)	Highest reading measured (W/m ²)
Urban	49	0.0000021 – 0.0016017	0.0025
Rural	17	0.0000043 – 0.000163	0.000163

Public Health Implication Based on the On-site Readings

ADHS generally follows a three-step methodology to assess public health issues related to environmental exposures. First, ADHS obtains representative environmental data for the site of concern and compiles a comprehensive list of site-related contaminants or concerns. Second, ADHS identifies exposure pathways, and then uses standards or guidelines to find those exposures that do not have a realistic possibility of causing adverse health effects. For the remaining exposures, ADHS reviews recent scientific studies to determine if exposures are sufficient to impact public health.

These on-site readings were compared to standards and guidelines, which are often used as screening tools to evaluate environmental data relevant to exposure pathways. The standards and guidelines are quite conservative, and include safety factors that account for sensitive populations (such as infants, young children, and elderly.) Adverse health effects are not expected to occur if an exposure level is below a health-based guideline. However, an exposure level at or above the health-based guideline does not mean adverse effects will occur. Rather, it means that there is a need to conduct a site-specific exposure scenario evaluation. The health risk for an individual depends on individual human factors (e.g. personal habits, occupation, and/or overall health), and site-specific environmental exposure factors (e.g. duration and amount of exposure). Therefore, the health-based guidelines should not be used to predict the occurrence of adverse health effects without looking at site-specific conditions.

ADHS typically uses standards and guidelines as follows: if an exposure is never found at levels greater than its standard or guideline, ADHS concludes the levels of corresponding exposure do not pose a risk to human health. If, however, an exposure is found at levels that are greater than its standard or guideline, ADHS examines potential human exposures in greater detail.

Meters communicate via radio frequency (i.e. AMI and AMR meters):

Measured power densities were compared to health-based guidelines (Table 6.) The 30-minute averages were calculated by using the top six 5-minute averages from a sampling location. This approach provided an estimation of the possible maximum 30-minute exposure throughout a day. The overall averages were calculated by using all 5-minute averages from a sampling location. This provided an estimation of the overall exposure throughout a day. ADHS used guidelines developed by FCC, ICNIRP, IEEE and Russia to evaluate the potential adverse health effects associated with exposures to radio frequency from AMI and AMR meters.

Short-term Exposure: FCC, ICNIRP and IEEE guideline values was determined based on established adverse thermal health effects. The purpose of these guidelines are to prevent whole-body heat stress and excessive localized tissue heating. The 30-minute averages ranged from 0.000021 to 0.000465 W/m² for AMR meters, and from 0.000028 to 0.001101 W/m² for AMI meters. None of these values exceeded the FCC (6 W/m²), or ICNIRP/IEEE (4.5 W/m²) guideline values (Table 6.)

Long-term Exposure: FCC does not have an established standard for non-thermal health effects because of insufficient information. Our review of US and most internal government assessments, and scientific publications indicated that there is no consistent or convincing evidence to support a cause-and-effect relationship related to the exposure to the RF frequency (900 – 930 MHz) used by the smart meters. The majority of the scientific studies concentrated on the possible health effects from mobile phone exposure. When compared to mobile phones, smart meters represent lower RF exposure sources because of the attenuation factor of the building structure (for example: walls), and the distance from radiation signal source (i.e. location of the smart meters and mobile phones in relation to the human body.) Based on these, it appears to us that exposures to smart meters would indicate even less association to non-thermal effects.

Our review indicated that Russia has developed a standard for radio frequency between 450 to 2,700 MHz for mobile phones. This standard was determined based on non-thermal health effects. We do not have access and do not have the ability to review the original paper (in Russian). The source indicated that this value was set based on an animal study consisting of 110 rats exposed to 900 and 1,800 MHz at 5 and 20 W/m². The results showed changes in the immune status of animals exposed to 5 W/m². A safety factor was applied to obtain the Russian standard of 0.1 W/m² for the general public. This limit was set to ensure that no exposure would cause any possible biological consequences among the exposed population. ADHS used the Russian standard as a comparison to ARRA's measurements. The results showed that none of the overall average readings of AMI (ranging from 0.000025 to 0.000888 W/m²) or AMR (ranged from 0.000016 to 0.000377 W/m²) meters exceeded the standard (Table 6.)

In this field investigation, ARRA measured the RF emission levels based on the worst case scenario. Such measurements do not necessarily reflect personal RF exposure (they tend to overestimate the RF exposures) because they are not always taken at the distance from the RF source that the person would typically be from the source (for example: inside the house.) Therefore, with the available information, exposures to AMI and AMR meters are not likely to harm the health of the public.

Table 6 shows the readings of power density from electronic meters communicating via radio frequency.

Meter Type	Number of meters measured	30-min average (W/m ²)	Highest reading measured (W/m ²)	Standards/ Guidelines (W/m ²)	
AMR ¹	17	0.000021 – 0.000465	0.001435	6	FCC
AMI ²	33	0.000028 – 0.001101	0.0025	4.5	ICNIRP/IEEE

1. AMR: Automated Meter Reading

2. AMI: Advanced Metering Infrastructure

3. FCC: U.S. Federal Communications Commission OET Bulletin 56, 47 CFR § 1.1310

4. ICNIRP: International Commission on Non-ionizing Radiation Protection
5. IEEE: Institute of Electrical and Electronics Engineers (IEEE)

Meter Type	Number of meters measured	Overall average (W/m ²)	Standards/ Guidelines (W/m ²)	
AMR ¹	17	0.000016 – 0.000377	0.1	Russian
AMI ²	33	0.000025 – 0.000888		

1. AMR: Automated Meter Reading
2. AMI: Advanced Metering Infrastructure

Meters that do not communicate via radio frequency (i.e. PLC and analog meters):

As described in previous sections, analog meters are not expected to emit any radio frequencies. The PLC meters communicate via power lines. During the data transmission process, a power frequency field of 60 Hz is produced. Power frequency is considered as a type of extremely low frequency (ELF) electric and magnetic field ranging from 3 to 3,000 Hz. In this range, electric and magnetic fields do not interrelate as higher-frequency waves (such as radiofrequency), and they are characterized separately. Electric field strength is measured in unit of volts per meter (V/m), and the magnetic field strength is measured in units of gauss (G) or tesla (T.) The strength of power radio frequency was not measured since it is not within the scope of this investigation. A detailed discussion of power line frequency can be obtained from a NIEHS publication¹ (NIEHS 2002.)

For the purpose of comparison, PLC and analog meters were included in the field investigation. Different levels of RF power density were detected from residences with PLC and analog meters during the field investigation. The measured RF levels from residences with analog and PLC meters were comparable to each other (see Table 3), and their respective background levels. For example, the three 5-minute average for one house were 0.0000178, 0.0000159, and 0.0000154 W/m². The background level was 0.0000142 W/m². The results suggest that only a very little amount of RF may be emitted from PLC meters.

Conclusions

Review of Radio Frequency Regulation and Literature:

ADHS reviewed: (1) regulatory standards developed by the US and other countries such as Australia, Canada, Russia, and New Zealand, (2) exposure recommendations provided by the International Committee on Non-Ionizing Radiation Protection (ICNIRP) and the Institute of Electrical and Electronics Engineers (IEEE), (3) smart meter radio frequency studies conducted by other states such as California, Texas, Maine, and Vermont, (4) peer-reviewed scientific publications, and (5) smart meter and RF

¹ EMF: Electric and Magnetic Field Associated with the Use of Electric Power

exposure related documents submitted to the Arizona Corporation Commission's eDocket. Based on the available information, ADHS found that:

- The majority of the countries determined their standards based on the recommendation of the ICNIP and IEEE. The values of specific absorption rate (SAR) and power density were established to prevent thermal effects from radio frequency radiation. No value was recommended for non-thermal effects because the ICNIP and IEEE, based on the available information, feel that the evidence from epidemiological and laboratory studies are not sufficient to identify there is a health hazard nor to be used as a basis to develop exposure guidelines.
- Russia set a much lower standard which was determined to prevent any possible biological consequences among the exposed population. The study was conducted by Russian scientists and the paper was written in Russian. ADHS was not able to review the report. The source indicated that the value was determined based on chronic immunology studies from a number of animal studies.
- States conducting radio frequency studies have similar findings, based on scientific literature review or field measurements. Their results agreed that the thermal effects of radio frequency are well understood, and the current FCC standard is sufficient to provide an adequate protection to prevent thermal effects. In addition, no sufficient evidence to support a need for additional standards to protect the public from electronic meters.
- ADHS concurs with the findings from the other states. ADHS reviewed articles on the potential health risks from RF radiation, mainly from wireless communication. The review examined the potential biological and health effects from exposure to RF fields from studies that have been published. The authors reviewed relevant research investigations in different areas: epidemiology studies, empirical studies in cell cultures and animals, and clinical human studies. An overall assessment was then conducted based on the aggregated evidence across reviewed areas. ADHS found that most experts agree that exposure to RF at high enough strengths for long enough time can result in adverse health outcomes from thermal effects. However, when discussing non-thermal adverse health outcomes, the literature is not clear.
- ADHS also reviewed articles published in the last five years that discussed the health concerns most noted by Arizona citizens. These health effects are: headaches, insomnia, cancer, ear pain/tinnitus, and fatigue. Most of the studies concluded that there was no association between RF exposure at low levels and adverse health outcomes. A couple of articles found weak associations. Some studies called for additional research.

Field Investigation:

ARRA conducted a field investigation to identify the levels of RF radiation emitted from different types of meters (i.e. analog, PLC, AMI, and AMR meters.) The measurements were taken from single family homes, and apartment complexes at rural and urban areas. After receiving data from ARRA, ADHS conducted an assessment to evaluate the potential health risks associated with exposure to radio frequency radiation emitted from electronic meters (i.e. AMI and AMR meters.) Based on the available information, ADHS reached the following conclusions:

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- The measured RF radiation emissions (in power density) from electronic meters are below the FCC standard of 6 watts per square meter (W/m^2).
- In general, the measured RF radiation emissions are higher from AMI and AMR meters. The measured RF radiation emission from analog and PLC meters are similar to the background levels.
- In general, for electronic meters, the measured RF radiation emissions are higher for apartment complexes when they are compared to single family homes.
- In general, for electronic meters, the measured RF radiation emission is higher from urban area when they are compared to those from rural area.
- *Exposure to electric meters (AMI and AMR) is not likely to harm the health of the public.* This conclusion was reached because (1) none of the detected power densities exceeded the FCC standard of $6 W/m^2$. This standard was determined based on thermal effects, and was set to prevent whole-body heat stress and excessive localized tissue heating; (2) available government assessments and scientific literature indicated that there is no consistent or convincing evidences to support a cause-and-effect relationship related to the exposures to the RF frequency (900 – 930 MHz) used by the smart meters ; (3) none of the detected power density exceeded the lowest available guideline of $0.1 W/m^2$ (determined by Russia.) This value was determined to ensure that no exposure would cause any possible biological consequences among the exposed population.

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Appendices

Appendix A: Health Concerns Mentioned in Submissions to the ACC eDocket

Health Concerns Mentioned in Submissions to the ACC eDocket		Number of times mentioned
Top Five Concerns	Headaches	28
	Insomnia	27
	Cancer	15
	Fatigue	14
	Ear pain/hearing	14
Other Health Concerns Mentioned	Difficulty concentrating/brain damage	12
	Heart problems/palpitations	12
	Agitation/Anxiety	11
	Depression	8
	Dizziness	8
	Nausea	7
	Muscle pains	6
	Hay fever/allergies	5
	Chest pain	5
	Seizures	5
	Shortness of breath	4
	High blood pressure	4
	Skin rashes	4
	Sperm production	3
	Autoimmune diseases	3
	Memory loss	3
	Confusion	3
	Shaky hands	2
	Nervous system issues	2
	Autism	2
	Fibromyalgia	1
	Hair loss	1
	Sore throats	1
	Miscarriage	1
	Birth defects	1
	Eye problems	1

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	Diarrhea	1
	High blood sugar	1
	Nose bleed	1
	Mutation	1
	Jaw pain	1
	Digestion problems	1
	Stroke	1
	Back pain	1
	Total Number of Health Concerns	164

Appendix B: Review of Submitted Articles

ADHS reviewed the articles submitted by concerned citizens related to potential health effects from the RF radiation produced by smart meters. The main points from the most cited articles are listed below, and ADHS's response is provided:

1. Article: "Electromagnetic and Radiofrequency Fields Effect on Human Health." The American Academy of Environmental Medicine (AAEM). 2008.

Main Points Stated by the Article:

- In the last 20 years, physicians began seeing patients who reported that electric power lines, televisions, and other electrical devices caused a wide variety of symptoms.
- Multiple studies correlate RF exposure with diseases such as cancer, neurological disease, reproductive disorders, immune dysfunction, and electromagnetic hypersensitivity.
- Exposure limits determined by the FCC and other regulatory agencies do not account for effects from non-thermal radiation.

ADHS's Response: AAEM are not recognized by the American Board of Medical Specialties.

2. Article: Loren Vanderlin. "Update and Review of Research on Radiofrequencies: Implications for a Prudent Avoidance Policy in Toronto." Toronto Public Health. November 2007.

Main Points Stated by the Article:

- Despite limitations in the body of research to date, the possibility of harmful health effects from RF exposures cannot be ruled out.
- Studies of the impacts on children from cell phone RFs, while limited in number, do not rule out the possibility that children require greater protection from RF exposure.
- Research in populations near cell phone base stations in Europe indicates that some people living within about 300 meters of a base station are more likely to experience symptoms, such as headache, memory changes, dizziness, tremors, depression, and sleep disturbance.
- In the face of uncertain risks, prudent avoidance is still the best approach to minimize public exposure from the new and increasing number of RF sources.
- In response to this article, Toronto Public Health (TPH) reviewed the predicted RF values provided by companies applying to install new cell phone base stations in Toronto and requested that providers keep RF emission levels 100 times below Safety Code 6, Health Canada's public exposure guideline. From its review of recent health evidence, TPH notes that the majority scientific opinion indicates that the health risk to the public from cell towers and other telecommunications sources of RFs is low.

ADHS Response: Although this article infers the biological feasibility of RF exposure and non-thermal effects, this article does not directly relate to the goals of this review. ADHS focused on

RF exposures in the home. RF exposure at or near cell towers tend to be at much higher power densities than that which are measured near electronic meters, and is therefore not within the scope of this report.

3. Article: Andrew Goldsworthy. "The Biological Effects of Weak Electromagnetic Fields – Problems and Solutions." March 2012.

Main Points Stated by the Article:

- Weak electromagnetic fields from cell phones, cordless phones, and WiFi can have serious effects on human and animal health. These include damage to glands resulting in obesity and related disorders, chronic fatigue, autism, increases in allergies and multiple chemical sensitivities, early dementia, DNA damage, loss of fertility, and cancer.
- The frequencies that give damaging biological effects lie between 6Hz and 600Hz. Virtually all digital mobile telecommunications systems use pulses within this range.
- Until the mobile telecommunications industry makes its products more biologically friendly, we have little alternative but to reduce our personal exposure as far as possible by using cell phones only in emergencies, avoiding cordless phones, and substituting WiFi with Ethernet.
- This article is only one of many included in the FCC's electronic comment filing system. To arrive at its guideline, the FCC considers a large number of comments submitted by industry, government agencies, and the public. The radiation emitted from smart meters is well below the FCC standard.

ADHS Response: This article references RF between 6 Hz and 600 Hz. However, the range of RF is actually 3KHz to 3GHz. EMF in the range of 6 Hz and 600 Hz is actually Extremely Low Frequency (1-300Hz) and Intermediate Frequency (IF) Fields (300 Hz – 10 MHz). This review focused on RF and did not research the potential health effects of ELF or IF.

Appendix C: Field Sampling Form

Meter Sampling Checklist

Name of technician: _____ RF Sampling Device: _____ / Calibration Date: _____

Please circle one for each option:

Single Family Home or Apartment Complex	Urban Area or Rural Area	Single meter or Multiple meters (# of meters: _____)
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Background reading in the shade: _____

Background reading in the sun: _____

Address: _____

Location of meter on home: garage or living space

Meter Model: _____

Time period:		Sample Time 1		Sample Time 2		Sample Time 3	
Weather Condition (circle one):		Sunny Partly Cloudy Mostly Cloudy		Sunny Partly Cloudy Mostly Cloudy		Sunny Partly Cloudy Mostly Cloudy	
Reading Taken in Shade (Yes/No)		Yes No		Yes No		Yes No	
Date and Time:							
Readings		Average	Max	Average	Max	Average	Max
Distance 1 foot	Measurement 1: (at 5 min)						
	Measurement 2: (at 10 min)						
	Measurement 3: (at 15 min)	*					

Comments:

Address: _____

Location of meter on home: garage or living space

Meter Model: _____

Time period:		Sample Time 1		Sample Time 2		Sample Time 3	
Weather Condition (circle one):		Sunny Partly Cloudy Mostly Cloudy		Sunny Partly Cloudy Mostly Cloudy		Sunny Partly Cloudy Mostly Cloudy	
Reading Taken in Shade (Yes/No)		Yes No		Yes No		Yes No	
Date and Time:							
Readings		Average	Max	Average	Max	Average	Max
Distance 1 foot	Measurement 1: (at 5 min)						
	Measurement 2: (at 10 min)						
	Measurement 3: (at 15 min)						

Comments: